WILL ARTIFICIAL INTELLIGENCE REPLACE ARBITRATORS UNDER THE FEDERAL ARBITRATION ACT?

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ABSTRACT

Can parties appoint an Artificial Intelligence ("AI") platform to serve as an arbitrator under the Federal Arbitration Act ("FAA")? Can a United States court invalidate an arbitration provision in a contract that specifies the resolution of a dispute through an AI platform? Can a U.S. court refuse to recognize an arbitral award that was rendered by an AI platform?

Intense lobbying efforts by business organizations led to the enactment of the FAA in 1925. While the business community lobbied for lower-cost litigation, the lawyer organizations, including the American Bar Association, were bystanders in the drafting of the legislative proposals. Nearly a century later, lawyers remain bystanders to innovation.

Changes must be made to the current model of legal education and the practice of law to make it more interdisciplinary. Lawyers fail to innovate because our educational and practice models are based on the study of the past ("precedent"). Lawyers are not trained to look to the future and have different goals than scientists and venture capitalists who drive the innovational targets. We must adopt emerging technologies that will lower the cost of legal services as we risk being forced out of the marketplace by AI platforms that will act as arbitrators. History will repeat itself as was the case in 1925 with the enactment of the FAA.

I. INTRODUCTION

[1]   In 2004, the movie *I, Robot* debuted, based on Isaac Asimov's *The Robot Series*, prophesying that scientists will create robots that will take over and render humanity obsolete.[1] Aside from the storytelling style of Asimov and others in fictionalizing science, humans have never been able to predict the future on Earth or elsewhere. There has never been a modern-day oracle of Delphi or Nostradamus that can accurately and reliably forecast the evolution of the social order and the changes that will come about from our predisposition to innovate. Similarly, we lack reliable predictive analytics that could help us visualize the technological breakthroughs of the future and the manner with which these discoveries will frame the standards and/or the hazards of our existence. What is certain, however, is that human achievement will progress at a blazingly fast directional spread, and we will be subjected to profound and rapid adaptability challenges that will force us to reassess many of our core values. Thus, the ultimate question is not whether changes will be so fundamental that whatever we know and do today will be altered, but whether we are ready to deal with these transformations.

[2]   The same holds for the field of law. In the U.S., lawyers tend to clutch tightly to outdated practice methods, partly due to a learning methodology that relies heavily on precedent—the study of past decisions that are binding on current day cases.[2] For the most part, litigation lawyers do not look to the future as there has to be a dispute that is ripe for adjudication, which also means looking at events and conduct of the past to determine liability and damages. This is a failing approach when it comes to innovation, as technological advances constantly expand the boundaries of human capability in every sector, including the practice of law. Thus, lawyers must master innovation and embrace technology wholeheartedly,

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[1] I, ROBOT (Twentieth Century Fox 2004) (crediting Asimov in the film's end credits); ISAAC ASIMOV, I, ROBOT (Del Ray 2020) (1950).

[2] Julie Young, *Stare Decisis*, INVESTOPEDIA (Dec. 2, 2021), https://www.investopedia.com/terms/s/stare_decisis.asp [https://perma.cc/GP5P-WD7E].

which in turn, will allow us to harmonize the legislative framework and the level of interaction between humans and the "cybersapiens" of the future.

[3]   The hourly billable structure of our profession also trails the ever-growing cost of running our offices, with rates that have skyrocketed considerably. We see the emergence of mega law firms, but we also maintain control of the profession by prohibiting nonlawyers from possessing any ownership interest in a law firm.[3] We make entry to our profession exceedingly difficult because of the standards we uphold, but *partly* because we seek to limit the competition in our sphere of services. Innovation, therefore, has been restricted to the development of platforms that help us do research or provide us with litigation support, while some tools can assist us in evaluating or summarizing non-disclosure agreements or other contractual arrangements.[4] However, lawyer fees are not commensurate with the market value of other similar services when "client expectations have changed and there are relentless demands to be more efficient and deliver more cost-effective services."[5] As a result, lawyers will soon compete with AI as the entire social order will be infiltrated by the incredible usefulness and breadth of its potential.

[4]   Law schools are also slow to change their curriculum so that it constantly adapts to the demands of technological discoveries. In a world of school ratings and the methodology of the American Bar Association ("ABA") approval process, most law schools struggle to stay financially

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[3] MODEL RULES OF PRO. CONDUCT r. 5.4 (AM. BAR ASS'N 1983). *But see* Lyle Moran, *Arizona approves nonlawyer ownership, nonlawyer licensees in access-to-justice reforms*, ABA J. (Aug. 28, 2020, 2:20 PM), https://www.abajournal.com/web/article/arizona-approves-alternative-business-structures-as-part-of-access-to-justice-reforms [https://perma.cc/6FDP-3387] (highlighting that Arizona recently became the second state allowing "nonlawyer ownership or investment in law firms").

[4] I do not address litigation support tools such as NexLP, Ross Intelligence, Ravn Systems, LawGeex, eBrevia or Omni Legal.

[5] Jeff Pfeifer, *The Data-Driven Lawyer and the Future of Legal Technology*, L. TECH. TODAY (Jan. 15, 2018), https://www.lawtechnologytoday.org/2018/01/the-data-driven-lawyer [https://perma.cc/992R-QHJV].

healthy and are often forced to prioritize resources at the expense of developing a technology-rich program that uses innovative resources.[6] Also, law schools have not adopted a truly interdisciplinary approach to teaching law, which suggests that they will not be leading the innovational spectrum of our profession. What is even more discouraging is that law schools are not filling the gap in the ever-increasing disconnection between law and the technological revolution. With time, it will be impossible to catch up. Most law students have never stepped foot in the engineering schools of their universities, and they have no interaction with scientists or science students. This is a monumental failure that we should not overlook.

[5]   In the context of technology, some lawyers view AI[7] as a malevolent threat or a technical trick that will transmogrify the practice of law and all aspects of our occupation. For conspiracy theorists, AI is a "monster" that will wreak havoc in every aspect of our professional existence, a form of an "extraterrestrial" power that will force humans to surrender our ingenuity to its technological prowess.[8] Some practitioners cannot be convinced otherwise, since: (1) practitioners lack knowledge of developing technologies and misunderstand the benefits of developing AI platforms; and (2) lawyers generally fail to grasp the implications of AI because they possess an attitude that demonizes the displacement of the human touch in

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[6] *See* Christine Charnosky, *'Innovation Averse' Law Schools Risk Missing Out on the Legal Industry's Regulatory Renaissance*, LAW.COM (Dec. 8, 2021, 12:14 PM), https://www.law.com/2021/12/08/innovation-averse-law-schools-risk-missing-out-on-the-legal-industrys-regulatory-renaissance/?slreturn=20220126151121 [https://perma.cc/PD5C-8B3R].

[7] Ryan Calo, *Artificial Intelligence Policy: A Primer and Roadmap*, 51 U.C. DAVIS L. REV. 399, 404 (2017) (defining AI "as a set of techniques aimed at approximating some aspect of human or animal cognition using machines").

[8] *See* David Auerbach, *The Most Terrifying Thought Experiment of All Time*, SLATE (July 17, 2014, 2:47 PM), https://slate.com/technology/2014/07/rokos-basilisk-the-most-terrifying-thought-experiment-of-all-time.html [https://perma.cc/GA25-D628].

many aspects of our profession.[9] Aside from short-termism and opposition to learning new methods of practicing law or fear of competition, lawyers will eventually confront AI platforms that can assess the credibility of witnesses and analyze the intent of the parties.

[6]   Undoubtedly, lawyers of the future will need to be technologically savvy with the programming concepts of "input," "output," and everything in between. Familiarity with the Model Law Rules or case precedent will be less important than the ability to configure the input data so that the output complies with our standard rates of acceptable bias.[10] A successful lawyer will be the one who can navigate the algorithms so that there is a minimization of the discrepancies in the vast amounts of "Big Data" that trustworthy AI platforms will process. In the arbitration field, the distant future belongs to 'tecarbitors', lawyers that will interface the vast data through the AI platforms so that the speedy decisions from these super-systems (future arbitrators) will comply with the standards of social responsibility consistently, reliably, and equitably.[11] Nonetheless, what is discouraging is that these fundamental changes will not be implemented because we are innovators, but because our clients will force them upon us.

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[9] *See* Simon Wormwell & Gillian Scott, *Lawyer and the AI knowledge gap*, OSLER (Dec. 7, 2021), https://legalyearinreview.ca/lawyers-and-the-ai-knowledge-gap [https://perma.cc/3CLU-H8E3]. *But see* Robert J. Ambrogi, *39 States Have Adopted the Duty of Technology Competence*, LAWSITES, https://www.lawnext.com/tech-competence [https://perma.cc/3UX5-83EU].

[10] *See* W. Nicholson Price II, *Medical AI and Contextual Bias*, 33 HARV. J.L. & TECH. 66, 67–68 (2019) ("Contextual bias is an under-addressed kind of bias in the legal AI literature. . . . [T]his bias arises in the process of translating algorithms from one context to another.").

[11] *See* Aditya Singh Chauhan, *Future of AI in Arbitration: The Fine Line Between Fiction and Reality*, KLUWER ARBITRATION BLOG (Sept. 26, 2020), http://arbitrationblog. kluwerarbitration.com/2020/09/26/future-of-ai-in-arbitration-the-fine-line-between-fiction-and-reality [https://perma.cc/5YYJ-ARSC] (implying that it is important to have lawyers familiar with AI systems in arbitration because AI-arbitrators have yet to possess the cognitive and emotional capabilities necessary in decision-making to replace human arbitrators).

[7]   This Article argues that clients will force their lawyers to implement AI platforms in resolving future disputes despite the hostility of the legal community in adopting methods that eliminate the human element. In Part II, this Article discusses the legislative history and intense lobbying efforts by business organizations leading to the enactment of the FAA in 1925. Part II concludes that the business community pressed the passage of the FAA to reduce the cost of litigation, while lawyer organizations, including the ABA, were bystanders in the drafting of the legislative proposals. Part III summarizes: (1) the various sections of the FAA that may be relevant in the context of AI, and (2) the decisions of the U.S. courts in how they interpret the provisions of the FAA. Part III concludes that while the FAA on its face does not prohibit the use of artificially intelligent platforms serving as arbitrators, the freedom of the parties to contract will ultimately be the decisive factor in support of such use. Part IV details some history of AI and brings the duplicating human intelligence into focus. Additionally, Part IV argues that lawyers mismanage innovation and fail to lead the legislative agenda. This article concludes that an interdisciplinary approach to the practice of law must be adopted, otherwise the business community will force lawyers to adapt again as it did in 1925 with the FAA.

II. THE FEDERAL ARBITRATION ACT ("FAA")[12]

[8]   Arbitration is an alternative dispute resolution process that parties negotiate at various stages.[13] It has many advantages over conventional litigation as it allows parties to design their own "efficient, streamlined procedures tailored to the type of dispute" at issue.[14] This freedom of contract does not apply to proceedings that implicate contractual or

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[12] 9 U.S.C. §§ 1–16; *see generally* Katherine V.W. Stone & Alexander J.S. Colvin, *The Arbitration Epidemic*, *in* 414 EPI BRIEFING PAPER 1, 7 (2015), https://files.epi.org/ 2015/arbitration-epidemic.pdf [https://perma.cc/TKP4-W86C] (describing the origins of the FAA).

[13] *See What is Arbitration?*, FINDLAW (June 20, 2016), https://www.findlaw.com/adr/ arbitration/what-is-arbitration-.html [https://perma.cc/CZ98-3SJV].

[14] AT&T Mobility LLC v. Concepcion, 563 U.S. 333, 344 (2011).

constitutional violations or claims that arise from the conduct of the parties when there are statutory rights at play, including the right to a trial by a jury of our peers.[15]

[9]   The FAA was enacted in the U.S. in 1925 and it "reflects a legislative determination of the desirability of arbitration as an alternative to litigation."[16] The FAA signaled "[a] liberal federal policy favoring arbitration"[17] and "place[d] arbitration agreements on equal footing with all other contracts."[18] Overall, the FAA was enacted to "[o]vercome the rule of equity, that equity will not specifically enforce and [sic] arbitration agreement."[19]

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[15] Leah Nicholls, *No, You Can't Just Write a Contract that Says No Federal Law Applies*, PUB. JUST. (Feb. 2, 2016), https://www.publicjustice.net/no-you-cant-just-write-a-contract-that-says-no-federal-law-applies [https://perma.cc/RX9Q-VP2W].

[16] Singer Co. v. Tappan Co., 403 F. Supp. 322, 329 (D.N.J. 1975); *see also* Whiteside v. Teltech Corp., 940 F.2d 99, 101 (4th Cir. 1991) (explaining that the Federal Arbitration Act's purpose is to show that "a written agreement to arbitrate is 'valid, irrevocable, and enforceable'"); Sharon Steel Corp. v. Jewell Coal & Coke Co., 735 F.2d 775, 777 (3d Cir. 1984) ("The district court correctly took note of the strong federal policy favoring arbitration.").

[17] *AT&T Mobility LLC*, 563 U.S. at 339.

[18] Buckeye Check Cashing, Inc. v. Cardegna, 546 U.S. 440, 443 (2006); *see also* Am. Express Co. v. Italian Colors Rest., 570 U.S. 228, 232–34 (2013) ("[The Act] reflects the overarching principle that arbitration is a matter of contract.").

[19] *Sales and Contracts to Sell in Interstate and Foreign Commerce, and Federal Commercial Arbitration: Hearing on S. 4213 and S. 4214 Before a Subcomm. of the S. Comm. on the Judiciary*, 67th Cong. 6 (1923) [hereinafter *Hearing on S. 4213 and S. 4214*] (statement of Sen. Thomas J. Walsh).

A. Judicial Hostility to Arbitration

[10]   Arbitration has not been viewed favorably by the judiciary.[20] The origins of this hostility can be traced to English common law.[21] It "manifested itself in a 'great variety' of 'devices and formulas' declaring arbitration against public policy."[22] English judges were paid on the number of cases they handled.[23] The courts at the time were "[o]pposed to anything that would altogether deprive every one of them of jurisdiction" and "[t]here has long been a great variety of available reasons for refusing to give effect to the agreements of men of mature age, and presumably sound judgment."[24]

[11]   This "firmly imbedded" hostility of English courts made its way to the American shores, since "[t]he courts have felt that the precedent was too firmly fixed to be overturned without legislative enactment although they

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[20] *See* Scherk v. Alberto-Culver Co.*, 417 U.S. 506, 510 (1974) ("The Unites States Arbitration Act . . . revers[ed] centuries of judicial hostility to arbitration agreements."); *see also AT&T Mobility LLC*, 563 U.S. at 339 ("The FAA was enacted in 1925 in response to widespread judicial hostility to arbitration agreements.") (citing Hall St. Associates LLC v. Mattel, Inc., 552 U.S. 576, 581 (2008)).

[21] Gilmer v. Interstate/Johnson Lane Corp., 500 U.S. 20, 24 (1991).

[22] *AT&T Mobility LLC*, 563 U.S. at 342 (citing Robert Lawrence Co. v. Devonshire Fabrics, Inc., 271 F.2d 402, 406 (2d Cir. 1959); *see also* Prima Paint Corp. v. Flood & Conklin Mfg. Co., 388 U.S. 395, 405 (1967) ("And it is clear beyond dispute that the federal arbitration statute is based upon and confined to the incontestable federal foundations of 'control over interstate commerce and over admiralty.'"); Red Cross Line v. Atlantic Fruit Co., 264 U.S. 109, 121–22 (1924) (stating that federal and state courts have largely denied "The federal courts—like those of the States and of England—have, both in equity and at law, denied, in large measure, the aid of their processes to those seeking to enforce executory agreements to arbitrate disputes.").

[23] David P. Pierce, *The Federal Arbitration Act: Conflicting Interpretations of its Scope*, 61 U. CIN. L. REV. 623, 625 (1992).

[24] U.S. Asphalt Refin. Co. v. Trinidad Lake Petroleum Co., 222 F. 1006, 1007 (S.D.N.Y. 1915) (quoting Scott v. Avery [1856] 10 Eng. Rep. 1121 (HL) 1138 (appeal taken from Eng.)).

have frequently criticised the rule and recognized its illogical nature and the injustice which results from it."[25]

[12]   The 1924 Senate Report 536 also cites two additional reasons for this hostility:

> [T]he expressed fear on the part of the courts that arbitration tribunals did not possess the means to give full or proper redress, and also the doubt they entertained as to their right to compel an unwilling party to submit his cause to such a tribunal, thus, denying to him the right to submit the same to the ordinary courts of justice for hearing and determination.[26]

As such, the legislature stepped in.

B. Legislative History

[13]   The FAA has a short storyline.[27] Charles L. Bernheimer, Chairman of the Committee on Arbitration of the Chamber of Commerce of the State of New York, led the campaign to enact the FAA along with attorney Julius Henry Cohen, who at the time was the General Counsel for the New York State Chamber of Commerce and also a member of the Committee on Commerce, Trade, and Commercial Law of the ABA.[28] The two men

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[25] The Silverbrook, 18 F.2d 144, 145 (E.D. La. 1927); *see* Wesley A. Sturges & Irving Olds Murphy, *Some Confusing Matters Relating to Arbitration Under the United States Arbitration Act*, 17 LAW & CONTEMP. PROBS. 580, 581–83, 593 (1952).

[26] In Ex parte Alabama Oxygen Co., 433 So.2d 1158 (Ala. 1983) (quoting S. REP. NO. 68-536, at 2 (1924)).

[27] *See generally* IAN R. MACNEIL, AMERICAN ARBITRATION LAW: REFORMATION, NATIONALIZATION, INTERNATIONALIZATION 47, 84, 88, 101 (1992) (describing the FAA's brief timeline).

[28] Margaret L. Moses, *Statutory Misconstruction: How the Supreme Court Created a Federal Arbitration Law Never Enacted by Congress*, 34 FLA. ST. U. L. REV. 99, 101 (2006).

worked tirelessly for several years and were successful in getting the state of New York to enact the first arbitration law in the country in 1920.[29]

[14]   On January 31, 1923, Senator Thomas Sterling submitted Bill 4214 to the U.S. Senate, and Representative Ogden L. Mills from New York filed a similar measure in the House as Number H.R. 13522.[30] Within hours of filing, the Senate Judiciary Committee held a hearing on the Bill.[31] The subcommittee made comments which were debated and further amended at the next ABA conference. The bill was refiled in Congress in 1924 as S. 1005 and H.R. 646, and a hearing was scheduled before a Joint Session of the Subcommittee of the Senate Judiciary Committee on January 9, 1924.[32] Following the hearing, the House of Representatives published a two-page report on January 24, 1924,[33] and the Senate published a report consisting of about three and a half pages on May 14, 1924.[34]

C. The FAA Was All About Business

[15]   There were "exceptionally meagre" floor debates in Congress.[35] The businessmen and their organizations joined forces in promoting the framework of the legislation while members of the various trade

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[29] *See* MACNEIL, *supra* note 27, at 31.

[30] *See Hearing on S. 4213 and S. 4214*, *supra* note 19, at 1–2.

[31] *See id.* at 1.

[32] *Arbitration of Interstate Commercial Disputes: Joint Hearings on S. 1005 and H.R. 646 Before the Subcomm. of the Comm. on the Judiciary*, 68th Cong. 1 (1924) [hereinafter *Joint Hearings on S. 1005 and H.R. 646*].

[33] MACNEIL, *supra* note 27, at 97.

[34] *Id*. at 100.

[35] Harry Baum & Leon Pressman, *The Enforcement of Commercial Arbitration Agreements in the Federal Courts*, 8 N.Y.U. L.Q. REV. 428, 429 (1931).

organizations traveled to Washington to testify at the hearings.[36] Although the ABA had taken up debates and commissioned research on arbitration, the powerful business organizations led the effort to pass the FAA and provided the basic framework with members of the business community participating at the ABA conferences.[37]

[16]   Senator Thomas Sterling of South Dakota presided over that Joint Committee hearing, along with several members of the House of Representatives.[38] Charles I. Stengle, the Representative from the State of New York, testified on behalf of the Brooklyn Chamber of Commerce, an organization founded on February 6, 1918 to protect and promote "the commercial and industrial interests of the city."[39] Representative Stengle referenced the sentiment of members of Congress, which was a sign of the success of the lobbying efforts of the business leaders: "and knowing how kindly disposed this subcommittee is to the question of arbitration legislation."[40]

[17]   Another discernible trend is that the legislators were not intensely engaged in the drafting, investigation, and/or framework of the FAA. For example, Senator John B. Kendrick from Wyoming confirmed the cursory oversight of the draft legislation:

> I have not had an opportunity or occasion to study this bill closely myself, but my people in the West have been wiring and writing me indorsing the proposed legislation . . . I want

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[36] MACNEIL, *supra* note 27, at 92–93.

[37] *Id.* at 41–42.

[38] *Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 1.

[39] *History*, BROOKLYN CHAMBER OF COM., https://www.brooklynchamber.com/who-we-are/history [https://perma.cc/2EBT-PTCG].

[40] *Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 1 (statement of Rep. Charles I. Stengle, New York).

> only at this time, through the convictions drawn from less than a careful study on my own account but from the attitude of business men of my section of the West, to give my indorsement . . . [41]

Chairman Sterling then asked Bernheimer to make his remarks, and he immediately underscored the support of the business community: "[i]t is from the business point of view that I will approach the subject of the reintroduced and slightly modified bill which is now before your committee."[42] Andrew J. Hickey, a representative from Indiana, then asked him: "Whom do you represent?"[43] Bernheimer responded:

> I represent the New York State Chamber of Commerce. I represent the Importers and Exporters' Association and the Merchants' Association of New York; and I have been, without definite appointment but so understood, representing the 73 business men's organizations that have added their names in formal indorsement of this bill.[44]

Bernheimer went on:

> I have been a member of the Chamber of Commerce of the State of New York for a little more than 20 years. I have been chairman of their committee on arbitration since the year 1911 . . . I have made a study of the question of arbitration ever since the panic of 1907. The difficulties merchants then met with, that of having repudiations and other business

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[41] *Id.* at 5 (statement of Sen. John B. Kendrick, Wyoming).

[42] *Id.* (statement of Charles L. Bernheimer, Chairman, New York State Chamber of Commerce).

[43] *Id.*

[44] *Id.* at 5–6.

> troubles, resulting in much loss and expense outside of the costly and ruinous litigation . . . [45]

Chairman Sterling then remarked to Bernheimer: "What you have in mind is that this proposed legislation relates to contracts arising in interstate commerce."[46] Bernheimer responded:

> [A]rbitration saves time, saves trouble, saves money . . . It preserves business friendships. The usual court atmosphere does not get into the arbitration hearings. For instance, at our New York State hearings we do not permit any abuse by one side or the other. Friendliness is preserved in business. It raises business standards.[47]

Thus, Bernheimer underscored the support of the business community for the FAA.

[18]   The short debate session in Congress centered around the rights of businesspeople in deciding matters related to the formation, execution, and enforcement of contracts.[48] Gray Silver of the American Farm Bureau Federation said: "[w]e are very much in favor of the objectives of an arbitration in commercial matters, believing it will be helpful in speeding business generally."[49] Mr. R. S. French, representing the National League of Marine Merchants of the United States, the Western Fruit Jobbers' Association of America, and the International Apple Shippers' Association of America, testified:

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[45] *Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 6.

[46] *Id.* at 7 (statement of Sen. Thomas Sterling, Chairman, Subcomm. of Sen. Comm. on the Judiciary).

[47] *Id.*

[48] *Id.*

[49] *Id.* at 11–12 (statement of Gray Silver, Representative, Am. Farm Bureau Fed'n).

The bill then before the Congress was unanimously approved by the organizations . . . [t]he interests I represent are large exporters and importers of perishable goods . . . We handle at home and from abroad over 600,000 carloads of freight annually, and naturally the opportunity for dispute arises frequently . . .[50]

C. G. Woodbury, the representative of the Canners' League of California, testified:

The Canners' League of California is a trade organization, comprising most of the fruit and vegetable canners of that State, and has requested us to bring to your attention the interests of this organization in the passage of Senate bill 1005 . . . The Canners' League has affirmed its indorsement of the measure, now pending as approved by the American Bar Association, and urges its enactment.[51]

Francis B. James of Westory Building (and a former member of the ABA Committee on Commerce, Trade, and Commercial Law[52]) also testified about the history of the proposals and the debates at the ABA meetings and conferences:

[t]he bill received consideration by the committee from three points of view: First, from the point of view of the public interest; second, from an economic point of view: third, as a technical piece of Federal legislation. It was the judgment of the committee that it was in the public interest . . .[53]

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[50] *Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 12 (statement of R.S. French, Representative, Nat'l League of Marine Merchs. of the United States).

[51] *Id.* at 13 (statement of C.G. Woodbury, Representative, Canners' League of Cal.).

[52] *Id.* at 19.

[53] *Id.* (statement of Francis James, Westory Building).

As such, the testimony showed wide support by the business community for the FAA.

[19]   Chairman Sterling then read telegrams and letters in support of the legislation. Secretary of Commerce Herbert Hoover called the bill an "emergency" measure.[54]

> The bills were drafted and approved by the American Bar Association and introduced by the same Senator and Representative last year, but did not reach the floor . . . The emergency to which I referred in my letter to Senator Sterling and which prompted so many important commercial bodies to ask for the prompt congressional relief of a very serious situation still exists . . .[55]

In a separate letter to Chairman Sterling, Secretary Hoover again noted the leading role of the business community in getting the ABA to support the proposed legislation:

> The American Bar Association has now joined hands with the business men of this country to the same effect and unanimously approved . . . a draft of a law prepared by its committee on commerce, trade and commercial law and approved of by a large number of associations of business men . . . The clogging of our courts is such that the delays amount to a virtual denial of justice . . .[56]

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[54] *Id.* at 20.

[55] *Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 20 (quoting Letter from Herbert Hoover, Sec'y of Com., to Frank B. Brandegee, Chairman, Judiciary Comm. (Jan. 7, 1924)).

[56] *Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 21 (quoting Letter from Herbert Hoover, Sec'y of Com., to Thomas Sterling, Chairman, Subcomm. of Sen. Comm. on the Judiciary (Jan. 31, 1923)).

Bernheimer then submitted the names of the 73 business organizations that expressed their support of the FAA by a formal vote.[57]

[20]   J. W. Davis, Chairman of the Legislative Committee of the American Fruit and Vegetable Shippers' Association, wrote to Congress explicitly emphasizing the business interests in the proposed legislation: "[i]t is legislation that is badly needed in order to cure certain trade evils."[58] Samuel M. Forbes, Secretary of the Converters' Association, also wrote to Congress:

> Our association has had very large experience under the New York arbitration act and with arbitration generally and . . . the adoption of a Federal arbitration act such as is now proposed will be one of the most forward steps in commercial life. Our members have found arbitration to be expeditious, economical, and equitable, conserving business friendships and energy.[59]

Henry L. Eaton of the American Fruit Growers Inc. of Pittsburgh also testified: "I am instructed by the officers of the association to appear and say that they are heartily in favor of the passage of this bill, because they believe it to be of benefit not only in their own business but to the whole country."[60]

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[57] *See id.* at 7–8.

[58] *Id.* at 22 (quoting Letter from J.W. Davis, Legis. Comm. Chairman, Am. Fruit and Vegetable Shippers' Ass'n, to Thomas Sterling, Chairman, Subcomm. of Sen. Comm. on the Judiciary (Jan. 7, 1924)).

[59] *Id.* at 23–24 (Letter from Samuel Forbes, Sec'y, Converters' Ass'n, to Thomas Sterling, Chairman, Subcomm. of Sen. Comm. on the Judiciary (Jan. 7, 1924)).

[60] *Id.* at 28–29 (statement of Henry Eaton, Representative, Am. Fruit Growers Inc.).

Alexander Rose testified on behalf of the Arbitration Society of America based in New York[61], emphasizing the participation of the business community during the time the Society was debating the proposal on arbitration:

> And at a meeting held at which there were some 250 merchants also participating, it was again unanimously indorsed by that other gathering . . . . So that you see you can have here a system of arbitration which is one that the people want; the public want it. They want speedy justice, and they want plain justice, in as simple terms as it can be reduced to.[62]

Rose also commented on the role of the lawyers, a reflection of the views of the organizations he represented: "The legal profession themselves are largely ignorant of the subject of arbitration and its benefits, because it has fallen so largely into disuse."[63]

[21]   At that time, Chairman Sterling asked Cohen whether the FAA would "prevent men from entering into agreements to arbitrate."[64] Cohen responded:

> The trade organizations today who are represented here by these various gentlemen have a tremendous interest and influence in establishing trade customs. That is nothing new

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[61] *See American Arbitration Association*, NOTABLE NAMES DATABASE, https://www.nndb.com/org/557/000117206 [https://perma.cc/ZCH8-NQPA] (noting that the American Arbitration Association ("AAA") was founded in 1926 by the merger of the Arbitration Society of America and the Arbitration Foundation).

[62] *Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 26–27 (statement of Alexander Rose, Representative, Arb. Soc'y of America).

[63] *Id.* at 28.

[64] *Id.* at 29.

> in the economic history of the world. And one of the trade customs that has been established, one of the rules of the trade is that if you belong to a trade you shall arbitrate your differences with them.[65]

Wilson J. Vance, Secretary of the New Jersey Chamber of Commerce, also testified: "And it took an elaborate system of education to convince even the business men that it was good for them . . . We believe that arbitration is a thing for honest men."[66] He also stated that few cases went to trial in the arbitration proceedings and that "[b]usiness men have adopted the practice of getting together and settling their business differences."[67]

[22]   Thomas B. Paton, representing the American Bankers' Association, submitted the resolution of the association adopted on January 26, 1923, which was accepted and made part of the Congressional record. [68]

[23]   Representative Dyer followed up with the question: "Would this legislation be of direct or indirect benefit to the Bankers Association?" to which Paton responded: "I think it would be of indirect benefit, because their interests are linked up with the merchants and business men of the country . . ."[69] Thus, the testimony and letters showed that the FAA was widely supported by the business community.

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[65] *Id.*

[66] *Id.* at 30 (statement of Wilson J. Vance, Sec'y, N.J. Chamber of Com.).

[67] *Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 31.

[68] *Id.* at 31 (citing Resolution, Am. Bankers' Ass'n, Resolution of American Bankers Association) (Jan. 26, 1923) ("Whereas all merchants doing interstate and foreign business seek a method whereby disputes arising in their daily business transactions can be speedily, economically, and equitably disposed of; and Whereas arbitration offers the best means yet devised for an efficient, expeditious, and inexpensive adjustment of such disputes").

[69] *Id.*

D. Attorney Cohen

[24]   Cohen was instrumental in passing the New York Arbitration Act, which served as the foundation in leveraging the passage of the FAA through Congress.[70] Cohen testified about the connection of lawyers to business interests: "we find the bar associations of the country aligned with the processes of business, so as to make the disposition of business in the commercial world less expensive and more expeditious."[71] He then described the justification for arbitration:

> [T]he right of freedom of contract, which the Constitution guarantees to men, includes the right to dispose of any controversy which may arise out of the contract in their own fashion . . . . Th[e] right of the settlement of controversy is always recognized . . . The difficulty is that men do enter into such agreements and then afterwards repudiate the agreement, and the difficulty has been that for over 300 years . . . the courts have said that that kind of an agreement was one that was revocable at any time.[72]

Cohen also explained the historical reasons behind the rule that a contract to arbitrate was not enforceable in equity, saying that "the real fundamental cause was that at the time this rule was made people were not able to take care of themselves in making contracts, and the stronger men would take advantage of the weaker, and the courts had to come in and protect them."[73]

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[70] *See generally id.* (illustrating how involved Cohen was in passing the New York Arbitration Act).

[71] *Id.* at 13.

[72] *Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 14 (statement of Julius Cohen, Attorney).

[73] *Id.* at 15.

Cohen also reiterated the business community's endorsement of the proposed legislation.[74]

[25]   Cohen then submitted a brief on the proposed legislation, which was received and made a part of the record without any objection. In it, Cohen laid out the proposed legislation, the provisions, and the history behind the effort to enact the federal legislation on arbitration.[75] Cohen's continued emphasis on the business community was evident not only because of his position as General Counsel for the New York State Chamber of Commerce, but because he understood that Congress was very much influenced by the business organizations and their lobbying efforts.[76]

E. The Role of Lawyers According to Bernheimer

[26]   Bernheimer was explicit about the role of the lawyers, the sentiment of the business community, and the need for arbitration when he explained, "[t]he most unprofitable thing that the merchant and business man, or anyone engaged in buying and selling, can have confront him is that of

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[74] *Id.* at 16 ("But the great field of business—why are these merchants and these fruit shippers and those who are represented here, why are they for this? Because of interstate business. . . . [B]ecause when business men know that they do not have to get a lawyer in California to enforce a case that does not involve more than four or five hundred dollars they will do more business. That is why the business men are behind this thing.").

[75] *See id.* at 38 ("Sound public policy demands the enforcement of arbitration agreements by the law. To argue that such agreements should receive only the sanction of business opinion and should remain extra legal is unsound. An agreement for arbitration is in its essence a business contract. It differs in no essential from other commercial agreements. It should stand upon the same plane and be regarded by the law in the same light.").

[76] *See* Federal Regulation of Lobbying Act, 2 U.S.C. § 261 (repealed 1995) (requiring mandatory disclosures of lobbying activities); *see also Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 41 (statement of Julius Cohen, Attorney) ("If business men desire to submit their disputes to speedy and expert decision, why should they not be enabled to do so? . . . In what respect does an arbitration agreement differ from any other commercial contract . . . We submit that there is no single argument respecting either considerations of morality or policy which soundly can be urged against the proposed statute.").

litigation. It is unprofitable to him and it is unprofitable to the State and it is unprofitable to the law office."[77]

[27]   In response, Israel M. Foster, a representative from Ohio, then asked Bernheimer: "Then do you think the bar associations indorse it?" to which Bernheimer responded, "I think so . . . The cheapest commodity that exists to-day is the fee that the lawyer charges the merchant, because . . . the average legal case, involving, say $3,000, or $4,000, does not allow the law office to recoup itself the overcharges for handling the case . . ."[78]

[28]   Bernheimer, although not a lawyer, was quite assertive in describing the sentiment of his constituents:

> The litigant's expenses—that is, whatever is necessary to cover the annual outlay for litigation or the fear of litigation, consultations with lawyers, the possibility of cancellations, and so forth, eventually creeps into the selling price . . . *The lawyer's work, as I stated before, is an economic wastage in the everyday commercial transactions. It does not benefit the lawyer and does not benefit the client.*[79]

Thus, Bernheimer believed the FAA would be mutually beneficial for lawyers and businesspeople.

F. The ABA Was a Bystander[80]

[29]   The ABA debated the proposed arbitration law for several years "having originated . . . at the 1918 meeting in Cleveland, where a subcommittee was appointed with direct instructions or mandate from the

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[77] *Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 6.

[78] *Id.*

[79] *Id.* at 7 (emphasis added).

[80] *See* MACNEIL, *supra* note 27, at 84.

organization to study the subject."[81] While there were several conferences and hearings during the years leading up to the enactment of the FAA, the ABA was not leading the effort to pass it.[82] Professor MacNeil refers to the ABA conference in 1919 as endorsing "a fairly long resolution urging bar associations to take steps to help prevent unnecessary litigation, [but] there is nothing in it specifically about arbitration."[83]

[30]   Following that conference, the ABA assigned the task of evaluating arbitration to its Committee on Commerce, Trade and Commercial Law, which then prepared a draft of the proposed legislation. The committee specifically alluded to the business interests supporting the proposals and that there had been: "great satisfaction on the part of business men with the principles and procedure of the New York Law and that it is desired that these principles should be made effective in interstate commerce, intrastate commerce and foreign commerce."[84] Finally, the "bill was . . . approved . . . at [the committee's] 1922 meeting in San Francisco. It was again approved at its 1923 meeting in Minneapolis."[85]

[31]   W. H. H. Piatt, Chairman of the Committee on Commerce, Trade and Commercial Law of the ABA, referenced the economic hardship of the ABA in not being able to have its members participate in the Congressional

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[81] *See Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 10.

[82] *See generally* MACNEIL, *supra* note 27, at 85, 91 (stating that reformers lead the effort with the help of the ABA committee but that passing the bill was not an urgent priority to the ABA).

[83] *Id.* at 197.

[84] AM. BAR ASS'N, REPORT OF THE FORTY-FIFTH ANNUAL MEETING OF THE AMERICAN BAR ASSOCIATION 293 (1922).

[85] *Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 34.

hearings or other State hearings.[86] However, Piatt's representative role at the hearings was also unclear since he responded to a question by Representative Israel M. Foster from Ohio regarding opposition from bar associations stating:

> I am also a member of . . . the Comercial [sic] Law League of America . . . A proposition of this kind has been before that association for some years, and those gentlemen . . . took quite a decided exception to the principle—not to this bill, but to the principle—for the reason that it might militate against business . . . So that while they, for three or four years, considered the matter and were opposed to it, they finally, last summer, approved this arbitration measure, and approved this bill unanimously at their meeting.[87]

There was some confusion between Cohen and Piatt on the position of the ABA.

> Mr. Piatt did a great injustice to the Bar Association by saying that we are so impoverished that they could not even pay his fare here—but we hold hearings in the committee on commerce, trade, and commercial law of the American Bar Association, and the lawyers were called in when those hearings were held, and the business men came in . . . [88]

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[86] *Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 10–11 (statement of W.H.H. Piatt, Comm. on Com., Trade, and Commercial L. Chairman, Am. Bar Ass'n) (*"Our funds are limited, as you gentlemen know, to the slight dues we pay, $6 a year, and we represent in membership about one-sixth of the profession; . . . and we have no funds to come before congressional committees or committees of State legislatures with our committees to bring before those bodies matters we work out and send to you and ask to have considered."*).

[87] *Id.* at 11.

[88] *Id.* at 17 (statement of Julius Henry Cohen, Attorney).

Despite the confusion, what is clear is that the business community led the effort in getting the ABA to support it and thereafter pass it through Congress.[89]

G. The Congressional Reports

[32]   Following the hearings, the House of Representatives published Report Number 96 on January 24, 1924, which "was drafted by a committee of the American Bar Association and is sponsored by that organization and by a large number of trade bodies whose representatives appeared before the committee on the hearing. There was no opposition to the bill before the committee."[90] The reverberation of the voices of the businesspeople who testified before Congress was evident. The Report concluded: "In view of the strong support of commercial and legal bodies, the entire lack of opposition before the committee, the obvious justice of the result sought to be attained**,** and the evident propriety and necessity of Federal action, we submit that the bill should become law."[91]

The US Senate published Report No. 536 on May 14, 1924, and stated that:

> "[i]t is not contended that agreements to arbitrate have no validity whatever . . . But it is very old law that the performance of a written agreement to arbitrate would not be enforced in equity . . . [s]uch agreements were in large part ineffectual, and the party aggrieved by the refusal of the other party to carry out the arbitration agreement was without adequate remedy."[92]

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[89] MACNEIL, *supra* note 27, at 89 ("The commercial bodies of the country have been urging the adoption of this principle of legislation throughout the country, and their point of view has now been accepted by the American Bar Association.").

[90] *Id.* at 97–98.

[91] H.R. REP. NO. 68-96, at 2 (1924).

[92] S. REP. NO. 68-536, at 2 (1924).

[33]   The FAA was enacted later in 1925.[93] Ultimately, the business community induced the passage of the FAA to reduce the cost of litigation, while the lawyer organizations, including the ABA, were bystanders in the drafting of the legislative proposals.[94]

III. AI AND THE FAA

[34]   This section summarizes: (1) the various sections of the FAA that may be relevant in the context of AI and (2) the decisions of the U.S. courts in how they interpret the provisions of the FAA. This section concludes that while the FAA on its face does not prohibit the use of AI platforms serving as arbitrators, the freedom of the parties to contract will ultimately be the decisive factor in support of such use.

A. Can Parties Appoint AI Platforms to Serve as Arbitrators Under the FAA?[95]

[35]   Section 5 of the FAA provides that parties are bound by the "method of naming or appointing an arbitrator or arbitrators or an umpire . . ."[96] While the FAA does not specifically exclude non-humans, the intent of the

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[93] 9 U.S.C. §§ 1–16.

[94] *See* MACNEIL, *supra* note 27, at 41, 89.

[95] *See generally* Migle Laukyte, *AI as a Legal Person*, *in* PROCEEDINGS OF INT'L CONF. ON A.I. & LAW 209, 213 (2019) (describing how AI platforms will eventually have a legal personality or personhood and suggesting a corporate type of a set-up, with similar registration requirements such that "legal personhood can reasonably be ascribed to AI"); Ryan Abbott, *The Artificial Inventor Project*, WIPO MAG. (Dec. 2019), https://www. wipo.int/wipo_magazine/en/2019/06/article_0002.html [https://perma.cc/MQY7-KBXA] (showing Stephen Thaler's DABUS, a machine listed as the inventor of the intellectual property it created, as an example of an emerging trend to attribute certain rights to such platforms); Lola v. Skadden, Arps, Slate, Meagher & Flom LLP, 620 F. App'x 37, 45 (2d Cir. 2015) ("[A]n individual who, in the course of reviewing discovery documents, undertakes tasks that could to otherwise be performed entirely by a machine cannot be said to engage in the practice of law.").

[96] 9 U.S.C. § 5.

parties will be the determinative factor in allowing AI platforms to serve as arbitrators in the future.[97] In *Mastrobuono v. Shearson Lehman Hutton, Inc.*, the U.S. Supreme Court remarked how it has "previously held that the FAA's pro-arbitration policy does not operate without regard to the wishes of the contracting parties."[98] The Court also confirmed that "[t]he FAA ensures that their agreement will be enforced according to its terms . . . "[99] Further, "[t]he scope of the arbitrators' power rests ultimately on the agreement of parties," according to the court in *Lundgren v. Freeman*.[100]

[36]   While the court in *Lundgren* was concerned with the *issues* the arbitrators considered and whether they exceeded their authority, and not *who* can arbitrate them, this decision underscores the idea that parties can challenge the authority of the arbitrators if they exceed the authority granted by the parties.[101] Ultimately, therefore, the parties control the authority of the arbitrators and what issues they can address. Since arbitration is a mutually agreed-upon process, "parties are generally free to structure their arbitration agreements as they see fit."[102]

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[97] *See generally* 9 U.S.C. §§ 1–16 (demonstrating that "parties" refers to individual(s), but the statute itself does make the distinction as to whether a party is human nor does it exclude non-humans).

[98] Mastrobuono v. Shearson Lehman Hutton, Inc., 514 U.S. 52, 57 (1995).

[99] *Id.* at 58 (stating that, at least in the context of arbitration proceedings, the FAA will preempt state laws, which could potentially include those state laws that may generally prohibit the utilization of AI platforms); *see also* Mayor of Baltimore v. Baltimore City Composting P'ship, 800 F. Supp. 305, 308 (D. Md. 1992) ("The intentions of parties to a contract are to be 'generously construed as to issues of arbitrability.'") (quoting Peoples Sec. Life Ins. Co. v. Monumental Life Ins. Co., 867 F.2d 809, 813 (4th Cir. 1989)).

[100] Lundgren v. Freeman, 307 F.2d 104, 109–10 (9th Cir. 1962).

[101] *See id.*

[102] *Mastrobuono*, 514 U.S. at 57 (quoting Volt Info. Scis., Inc. v. Bd. Trs., 489 U.S. 468, 479 (1989)); *see also* McMahon v. Shearson/Am. Exp., Inc., 709 F. Supp. 369, 373 (S.D.N.Y. 1989) ("The method agreed upon by the parties for naming an arbitrator is explicit and unambiguous and therefore must be given controlling effect. We have no power to change any of the terms of the agreement.").

[37]   In *Stolt-Nielsen S.A. v. AnimalFeeds Int'l Corp.*, the Supreme Court reiterated that, of course, parties "may specify with whom they choose to arbitrate their disputes."[103] In *Mitsubishi v. Soler Chrysler-Plymouth*, the Court echoed the remarks of the businesspeople who testified before Congress during the legislative sessions to enact the FAA when it referenced "adaptability and access to expertise" as the "hallmarks of arbitration."[104] The Court also acknowledged that, often, parties agree to arbitrate their disputes because it serves their best interests, which may include "streamlined proceedings and expeditious results."[105]

[38]   In *Henry Schein, Inc. v. Archer & White Sales, Inc.*, the Supreme Court recognized the parties' right to freely negotiate contracts, explaining: "When the parties' contract delegates the arbitrability question to an arbitrator, a court may not override the contract. In those circumstances, a court possesses no power to decide the arbitrability issue."[106] Also, the Court held: "We must interpret the Act as written, and the Act in turn requires that we interpret the contract as written."[107] The decision in *Henry Schein* could arguably be viewed as having a limited application on the delegation of the arbitrability issue under the "wholly groundless" exception.[108] While this decision pertains to whether a particular *subject* can be arbitrated, not *who* can arbitrate, it is not unreasonable that, because of

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[103] Stolt-Nielsen S. A. v. AnimalFeeds Int'l Corp., 559 U.S. 662, 683 (2010) (emphasis omitted).

[104] Mitsubishi Motors Corp. v. Soler Chrysler-Plymouth, 473 U.S. 614, 633 (1985).

[105] *See id.* at 633–34, 636–38 (rebutting the presumption that their best interests could not be serve through arbitration).

[106] Henry Schein, Inc. v. Archer & White Sales, Inc., 139 S. Ct. 524, 529 (2019).

[107] *Henry Schein*, 139 S. Ct. at 529.

[108] *See id.* at 528.

the Court's strong deference to the parties' rights, such an opinion may suggest that parties can designate AI platforms to serve as arbitrators.[109]

[39]   A second important factor is that courts will appoint arbitrators *only* in the absence of an agreement between the parties. In *ATSA of California, Inc. v. Continental Ins. Co.*, the Court of Appeals for the 9th Circuit held:

> [T]he district court's order must be modified to allow ATSA and Cairo to attempt arbitration as they originally contemplated, i.e., using two partisan arbitrators and one umpire. If they cannot select an umpire, they may then be required to proceed under the [International Chamber of Commerce] rules, which require neutral arbitrators.[110]

Also, in *Schulze and Burch Biscuit Co. v. Tree Top, Inc.*, the District Court found that an arbitration clause demonstrated the parties' intent due to their prior dealings, and even though there was no written agreement on all the terms, the Court interpreted the agreement in order to determine the arbitrators and designate the applicable arbitration rules and the forum.[111] The Court explained:

> The arbitration provision is not so vague as to leave the parties unable to determine which association will arbitrate the dispute. Implicit in the terminology of the arbitration agreement is the parties' prior course of dealings. The parties' prior dealings involved Rudolph Brady. The deposition testimony of food broker Rudolph Brady

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[109] *See id.* ("[W]e are not at liberty to rewrite the statute passed by Congress and signed by the President. When the parties' contract delegates the arbitrability question to an arbitrator, the courts must respect the parties' decision as embodied in the contract.").

[110] ATSA of California, Inc. v. Continental Ins. Co., 702 F.2d 172, 176 (9th Cir. 1983), *rev'd*, 754 F.2d 1394, (9th Cir. 1985).

[111] Schulze & Burch Biscuit Co. v. Tree Top, Inc., 642 F. Supp. 1155 (N.D. Ill. 1986), *aff'd*, 831 F.2d 709 (explaining that the court interpreted the contract terms).

> demonstrates that the arbitration clause contained in the
> parties' contract referred to AAA arbitraters [sic].[112]

The Court of Appeals affirmed, even when the parties' agreement to arbitrate appeared to be vague, limited to one simple sentence: "All disputes under this transaction shall be arbitrated in the usual manner."[113]

[40]   In *Scherk v. Alberto-Culver Co.,* the Court held that: "An agreement to arbitrate before a specified tribunal is, in effect, a specialized kind of forum-selection clause that posits not only the situs of suit, but also the procedure to be used in resolving the dispute."[114] The Court confirmed the parties' choice of forum selection clause as controlling "absent a strong showing that it should be set aside" as this is "an indispensable element in international trade, commerce, and contracting."[115] Thus, an AI arbitral platform could be viewed as a forum choice.

[41]   In *Mitsubishi v. Soler Chrysler-Plymouth*, the Court held that parties will be bound to the arbitral forum as they swapped the "procedures and opportunity for review of the courtroom for the simplicity, informality, and expedition of arbitration."[116] In *The Bremen v. Zapata Off-Shore Co.*, the Court found the "expanding horizons of American contractors who seek

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[112] *Id.* at 1156-57 (internal citations omitted).

[113] Schulze & Burch Biscuit Co. v. Tree Top, Inc., 831 F.2d 709, 715–16 (7th Cir. 1987) (emphasis omitted) ("Schulze does not cite a case in which the court has found an arbitration clause fatally vague, nor has our research unearthed one. . . . Thus, the clause is not too vague to be enforced. The district court was able to direct enforcement of the clause without resort to speculation and without writing a clause for the parties.").

[114] Scherk v. Alberto-Culver Co., 417 U.S. 506, 519 (1974).

[115] *Id.* at 516, 518–19 ("A contractual provision specifying in advance the forum in which disputes shall be litigated . . . obviates the danger that a dispute under the agreement might be submitted to a forum hostile to the interests of one of the parties or unfamiliar with the problem area involved.").

[116] Mitsubishi Motors Corp. v. Soler Chrysler-Plymouth, 473 U.S. 614, 628 (1985).

business in all parts of the world" as compelling grounds to uphold such clauses.[117] Additionally, the Court held that parties can designate a particular forum for the resolution of their disputes and such a "freely negotiated private international agreement, unaffected by fraud, undue influence, or overwhelming bargaining power . . . should be given full effect" because such contracts are "made in an arm's-length negotiation by experienced and sophisticated businessmen."[118]

[42]   In some cases, the courts have identified the arbitrator as an advocate for the parties. The District Court in *Petrol Corp. v. Groupement D'Achat Des Carburants* held: "Although the charter provided for a three-man board of arbitration, no reason appears why the parties could not mutually agree to let one arbitrator decide the issue, treating him as an umpire and the other arbitrators as advocates and agents of the parties designating them."[119] In *Stinson v. America's Home Place, Inc*, Judge Myron H. Thompson found the arbitration clause enforceable even when the arbitrator designated by the parties "was not in existence at the time the contract was formed or at any time thereafter."[120] While this related to an organization that ceased to exist, Judge Thompson rejected the argument that the non-existence of the arbitrator at the time the parties executed the contract rendered performance of the arbitration clause impossible, thereby excusing the parties from being bound by the contractual obligations.[121]

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[117] Bremen v. Zapata Off-Shore Co., 407 U.S. 1, 11 (1972).

[118] *Id.* at 12–13.

[119] Petrol Corp. v. Groupement D'Achat Des Carburants, 84 F. Supp. 446, 448 (S.D.N.Y. 1949).

[120] Stinson v. America's Home Place, Inc., 108 F. Supp. 2d 1278, 1284–85 (M.D. Ala. 2000).

[121] *Id.* at 1285.

1. Arbitrators Need Not Be Lawyers

[43]	The FAA does not prohibit parties from selecting non-lawyer arbitrators.[122] For example, in *M. De Matteo Constr. Co. v. Maine Turnpike Authority*, the U.S. District Court for the 1st Circuit recognized an engineer as an arbitrator.[123] In *Kentucky River Mills v. Jackson*, the Court of Appeals for the 6th Circuit held: "[a]rbitrators are selected to act in a quasi-judicial capacity, in the place of a court, and must be fair and impartial so as to render a faithful, hones [sic], and disinterested opinion, in carrying out their obligation to do justice to the parties through their award."[124] In a case decided by the Southern District of New York, it is further described that:

[44]	After all, arbitrators are not judges. Nowhere in the Federal Arbitration Act does Congress confer upon these private citizens the power to bind individuals and businesses except in so far as the relevant individuals and businesses have bound themselves.[125]

[45]	Also, in *Prima Paint Corp. v. Flood & Conklin Mfg. Co.*, Justice Black, joined by Justice Douglas and Justice Stewart, dissented, noting several important points: "the arbitrators who the Court holds are to adjudicate the legal validity of the contract need not even be lawyers, and in all probability will be nonlawyers, wholly unqualified to decide legal issues, and even if qualified to apply the law, not bound to do so."[126]

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[122] 9 U.S.C. § 5; *see also* Parke Constr. Co. v. Constr. Mgmt. Co., 246 S.E.2d 564, 568 (N.C. Ct. App. 1978) (ruling that anyone can be the arbitrator if the parties contractually agreed to the appointment of that person).

[123] M. De Matteo Constr. Co. v. Maine Tpk. Auth., 184 F. Supp. 907, 913 (D. Me. 1960).

[124] Kentucky River Mills v. Jackson, 206 F.2d 111, 117 (6th Cir. 1953).

[125] Jock v. Sterling Jewelers Inc., 284 F. Supp. 3d 566, 571 (S.D.N.Y. 2018).

[126] Prima Paint Corp. v. Flood & Conklin Mfg. Co., 388 U.S. 395, 407 (1967) (Black, J., dissenting).

Thus, the FAA does not prohibit parties from selecting non-lawyer arbitrators.

2. Disqualification

[46]   Parties could challenge AI platforms serving as arbitrators by seeking to disqualify them on several grounds. It has been held:

> [M]ere personal friendship with one of the parties does not disqualify an arbitrator . . . But it is the proof of bias or unfairness or partiality on the part of an arbitrator that results in unjust advantage, and calls for the setting aside of the award.[127]

However, the specific grounds for seeking to disqualify arbitrators under the FAA do not appear to include the non-human nature of the AI platforms. For example, a related issue arose in *State v. Loomis*, where an algorithmic risk assessment tool used in sentencing was determined to not violate a defendant's due process rights by the Wisconsin Supreme Court.[128] The defendant claimed that the use of the algorithmic platform violated his due process rights because he could not challenge the platform's scientific validity due to its proprietary nature and trade secrets.[129] The Wisconsin Supreme Court upheld the use of the algorithmic tool because it has the "potential to provide sentencing courts with more complete information to address this enhanced need."[130]

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[127] *Kentucky River Mills*, 206 F.2d at 117.

[128] State v. Loomis, 881 N.W.2d 749, 749 (Wis. 2016).

[129] *Id.* at 760–61.

[130] *Id.* at 753 ("The concerns we address today may very well be alleviated in the future. It is incumbent upon the criminal justice system to recognize that in the coming months and years, additional research data will become available. Different and better tools may be developed. As data changes, our use of evidence-based tools will have to change as well. The justice system must keep up with the research and continuously assess the use of these tools.").

[47]   Defendants in criminal cases have vastly different rights than parties agreeing to submit their disputes to arbitration. However, *State v. Loomis* is indicative that AI platforms could be challenged based on trustworthiness rather than the traditional grounds of bias, unfairness, or partiality.[131] This is a distinctive feature involving AI systems due to the stealth features of the operating systems and the proprietary nature of their algorithms.[132] It is unclear whether trustworthiness is a ground covered by the FAA and there is very little legislative activity in setting forth the necessary guidelines in building trustworthy AI platforms.[133]

[48]   Nonetheless, the efforts will intensify over time, leading to legislative proposals that will eventually address these issues. For instance, in April 2019 the European Union published its Draft Ethics Guidelines for Trustworthy AI:

> Trustworthy AI has three components, which should be met throughout the system's entire life cycle: (1) it should be

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[131] *See id.* at 760 (implying that the defendant challenged the trustworthiness of a COMPAS risk assessment because he was denied full access to information in the presentence investigation report (PSI) and could not ensure that he was being sentenced on accurate information).

[132] *Cf.* Priya Krishnan, *How IBM makes AI based on trust, fairness and explainability*, IBM: WATSON BLOG, (Oct. 22, 2020), https://www.ibm.com/blogs/watson/2020/10/how-ibm-makes-ai-based-on-trust-fairness-and-explainability [https://perma.cc/4S49-VDDS] ("IBM Research has broken its taxonomy of AI trust into three dynamics: [1] Ethics, [2] Governance, [3] Trustworthiness. To take those ideas further, trust in AI means understanding: [1] Where the data is coming from, [2] How that data is being used, [3] What data the training model contains, [4] How all of this affects the entire lifecycle of the AI. For IBM, trust is a foundational pillar of AI."); *see also* Irfan Saif & Beena Ammanath, *'Trustworthy AI' is a framework to help manage unique risk*, MIT TECH. REV., (Mar. 25, 2020), https://www.technologyreview.com/2020/03/25/950291/trustworthy-ai-is-a-framework-to-help-manage-unique-risk [https://perma.cc/BNW6-AZQ2] (discussing the human challenges businesses face due to the continued growth of AI and the need for establishing a trustworthy AI framework).

[133] *See generally* 9 U.S.C. §§ 1–16 (showing the lack of guidance in establishing guidelines for building "trustworthy" AI platforms).

lawful, complying with all applicable laws and regulations (2) it should be ethical, ensuring adherence to ethical principles and values and (3) it should be robust, both from a technical and social perspective since, even with good intentions, AI systems can cause unintentional harm.[134]

Also, on December 4, 2018, the Université de Montréal, in collaboration with the Fonds de recherche du Québec, the Montréal Declaration for Responsible Development of AI issued principles on the Development of AI.[135] Further, on February 11, 2019, former President Donald J. Trump signed an Executive Order designating the National Science and Technology Council Select Committee on Artificial Intelligence as the coordinating authority for the promotion of AI.[136] The Initiative seeks to stimulate research in AI and to "improve data and model inventory documentation to enable discovery and usability, and shall prioritize improvements to access and quality of AI data and models based on the AI research community's user feedback."[137] Legislative proposals will eventually follow these initiatives and therefrom the question of AI trustworthiness in relation to the FAA will be resolved.

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[134] HIGH-LEVEL EXPERT GRP. ON A.I., EUR. COMM'N, ETHICS GUIDELINES FOR TRUSTWORTHY AI 2 (2019), https://www.aepd.es/sites/default/files/2019-12/ai-ethics-guidelines.pdf [https://perma.cc/QFV9-HVZ2] (emphasis omitted); *see also* INFO. COMM'R OFF. & ALAN TURING INST., EXPLAINING DECISIONS MADE WITH AI 2 (2019), https://ico.org.uk/media/about-the-ico/consultations/2616433/explaining-ai-decisions-part-2.pdf [https://perma.cc/8Z68-U9DY] (detailing the guide of the UK's Data Protection Authority regarding AI decisions).

[135] UNIVERSITÉ DE MONTRÉAL & FONDS DE RECHERCHE DU QUÉBEC, 2018 REPORT: MONTRÉAL DECLARATION FOR A RESPONSIBLE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE 4 (2018), https://monoskop.org/images/b/b2/Report_Montreal_Declaration_for_a_Responsible_Development_of_Artificial_Intelligence_2018.pdf [https://perma.cc/C8J6-KU85]; *Developing AI in a responsible way*, UNIVERSITÉ DE MONTRÉAL (Dec. 4, 2018), https://nouvelles.umontreal.ca/en/article/2018/12/04/developing-ai-in-a-responsible-way/ [https://perma.cc/Q4XD-D9AW].

[136] Exec. Order No. 13,859, 84 Fed. Reg. 3967 (Feb. 14, 2019).

[137] *Id.*

3. Waiver

[49]   Even if there are disqualifying grounds, parties have the right to waive them. It is explained that "[t]he right to arbitration, like any other contract right, can be waived. A party waives his right to arbitrate when he actively participates in a lawsuit or takes other action inconsistent with that right."[138] Also, in *Petrol Corp. v. Groupement D'Achat Des Carburants,* the court held: "[I]nterest or bias may disqualify an arbitrator, [but such disqualification] may be waived if a party with knowledge thereof proceeds with the arbitration without objection."[139] Further, for example, "[t]hat an engineer may act in other respects as agent of one party and may be employed by one party does not of itself disqualify him from acting as independent arbiter or umpire if the parties so agree."[140] Thus, waiver is always an option for the parties.

B. Can a Court Vacate an Arbitration Award Under the "Savings Clause" of the FAA?

[50]   Section 2 is the centerpiece of the FAA, covering arbitration provisions that parties have negotiated in any "contract evidencing a transaction involving commerce . . . "[141] It further provides that an arbitration provision is "valid, irrevocable, and enforceable, save upon such grounds as exist at law or in equity for the revocation of any contract."[142] Under this so-called "savings clause," courts have invalidated arbitration provisions only upon "generally applicable contract defenses, such as fraud,

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[138] Cornell & Co. v. Barber & Ross Co., 360 F.2d 512, 513 (D.C. Cir. 1966).

[139] Petrol Corp. v. Groupement D'Achat Des Carburants, 84 F. Supp. 446, 447 (S.D.N.Y. 1949).

[140] M. De Matteo Const. Co. v. Maine Tpk. Auth., 184 F. Supp. 907, 913 (D. Me. 1960).

[141] 9 U.S.C. § 2.

[142] *Id.*

duress, or unconscionability."[143] Thus, a party could theoretically challenge AI platforms serving as arbitrators on general contract principles under § 2. However, such challenges are not routine.

[51]   In *Rodriguez de Quijas* v. *Shearson/American Express, Inc.,* the Supreme Court held that courts continue to have the authority to revoke contracts and deny requests for arbitration under § 2 when parties present substantiated evidence of "fraud or overwhelming economic power."[144] The Sixth Circuit has also held "that absent a showing of fraud, duress, mistake, or some other ground upon which a contract may be voided, a court must enforce a contractual agreement to arbitrate."[145]

[52]   Excluded from the savings clause are defenses "that apply only to arbitration or that derive their meaning from the fact that an agreement to arbitrate is at issue."[146] In *JLM Industries, Inc. v. Stolt-Nielsen SA,* the Court of Appeals held that the Arbitration clause contained in form charter contract "itself is [not a] unconscionable or oppressive term of adhesion" given that "JLM is a large and sophisticated commercial enterprise that was familiar with and well understood the [contract's] terms."[147] Also, the word "revocation" does not amount to an annulment of an otherwise valid and enforceable contract but only applies to "cases in which the courts will step in and rescind the agreement, for reasons such as fraud, duress, or undue influence."[148]

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[143] Rent-A Center, W., Inc. v. Jackson, 561 U.S. 63, 68 (2010) (quoting Dr.'s Assocs., Inc. v. Casarotto, 517 U.S. 681, 687 (1996)).

[144] Rodriguez de Quijas v. Shearson/Am. Express, Inc., 490 U.S. 477, 483–84 (1989).

[145] Scovill v. WSYX/ABC, Sinclair Broad. Group, Inc., 312 F. Supp. 2d 955, 963 (S.D. Ohio 2004).

[146] Poublon v. C.H. Robinson Co., 846 F.3d 1251, 1259 (9th Cir. 2017).

[147] *See* JLM Indus., Inc. v. Stolt-Nielsen SA, 387 F.3d 163, 170 n.5 (2d Cir. 2004).

[148] World Brilliance Corp. v. Bethlehem Steel Co., 342 F.2d 362, 364 (2d Cir. 1965).

[53]   In cases involving claims of duress, courts have consistently found arbitration provisions enforceable. For example, in *S+L+H S.p.A. v. Miller-St. Nazianz, Inc.*, the Court of Appeals for the 7th Circuit upheld arbitration clauses because the domestic distributor did not show "a wrongful or unlawful act or threat" or that the distributor "[assented] to the Agreement solely to protect its business."[149] Thus, the standard contract-based defenses will not be sufficient to defeat the appointment of an AI platform as an arbitrator under the savings clause of § 2.

C. Can a Court Refuse to Refer a Dispute to Arbitration to be Conducted by an AI Platform?

[54]   Another possible challenge could be leveled under § 3 of the FAA.[150] The courts have the preliminary task of evaluating arbitration provisions and "upon being satisfied that the issue involved in [a] suit or proceeding is referable to arbitration . . . , shall on application of one of the parties stay the trial of the action until such arbitration has been had in accordance with the terms of the agreement . . . "[151] However, the court expanded the scope of what is "referable" under the FAA to include most claims.[152] Thus, it will be difficult to challenge an agreement of the parties to refer any disputes to an AI platform, as not referable under § 3 of the FAA, based solely on the non-human nature of such platforms.

[55]   In *Scherk v. Alberto-Culver Co.*, the Court's holding signals the prevalence of the FAA over the Securities Act of 1934 due to the

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[149] *See* S+L+H S.p.A. v. Miller-St. Nazianz, Inc., 988 F.2d 1518, 1519 (7th Cir. 1993); Hellenic Lines, Ltd. v. Louis Dreyfus Corp., 372 F.2d 753, 758 (2d Cir. 1967).

[150] 9 U.S.C. § 3.

[151] *Id.*

[152] New Prime, Inc. v. Oliveira, 139 S. Ct. 532, 537 (2019) (holding that courts will decide the issues of "exemption" under Section 1 of the FAA involving the "contracts of employment" of certain transportation workers even when the contract delegates the question of arbitrability to the arbitrator).

developments in the commercial arbitration area and the adoption by the U.S. of the United Nations Convention on the Recognition and Enforcement of Foreign Arbitral Awards.[153] In *Mitsubishi v. Soler Chrysler-Plymouth*, the Court reversed the lower court's holding that antitrust claims were not arbitrable under the FAA.[154] The Court addressed whether claims that arise from statutes enacted to protect certain classes of people could be submitted to arbitration.[155] In rejecting the notion that arbitration was not warranted, the Court reasoned that the overarching guidelines under the FAA require parties to submit to arbitration even when their claims are based on specific statutory rights.[156] In doing so, the Court expanded the scope of the FAA from a purely contract-based legislative act to cover claims involving statutory rights.[157]

[56]   However, the Court did not eliminate the courts' role in the process, but instead held that each statute must be evaluated independently so that Congress' intent can be deduced from the legislative history or the statutory text.[158] Arbitration is even warranted in antitrust matters, which typically involve protracted litigation and "an image of intractability."[159] In *Shearson/American Express v. McMahon*, the Court reviewed claims brought under §§ 10(b) and 10b-5 of the Securities Exchange Act of 1934 (Exchange Act) and a claim under the Racketeer Influenced and Corrupt

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[153] *See* Scherk v. Alberto-Culver Co., 417 U.S. 506, 520 n.15 (1974).

[154] Mitsubishi Motors Corp. v. Soler Chrysler-Plymouth, Inc., 473 U.S. 614, 628–29 (1985).

[155] *Id.* at 625.

[156] *Id.* at 626.

[157] *Id.* at 627 (explaining that absent fraud or excessive economic power, "the Act . . . provides no basis for disfavoring agreements to arbitrate statutory claims by skewing the otherwise hospitable inquiry into arbitrability").

[158] *Id.* at 628.

[159] Scherk v. Alberto-Culver Co., 417 U.S. 506, 633 (1974).

Organizations Act (RICO).[160] The Court ordered both claims to be arbitrated per the terms of the agreements.[161] On the RICO claim, the Court reviewed the text and the legislative history of the statute and found no congressional intent to exclude such claims from the FAA.[162]

[57]   In 1984, the Court changed the scope of the FAA in *Southland Corp. v. Keating* by preempting state law that was contrary to the spirit of the FAA.[163] The Court, using Congress' plenary power under the Commerce Clause, extended the reach of the FAA to all states and held that the FAA is not a procedural statute that applies to cases adjudicated only in the federal courts, but that "Congress intended to foreclose state legislative attempts to undercut the enforceability of arbitration agreements."[164]

[58]   Furthermore, in *Dean Witter Reynolds, Inc. v. Byrd*, the Court considered the issue of whether courts could compel the parties to submit to arbitration in cases where the parties had federal securities claims and pendent state claims.[165] The Court held that the FAA mandates that courts compel parties to arbitration even if such a decision creates "inefficient maintenance of separate proceedings in different forums."[166]

[59]   Also, in *Prima Paint Corp. v. Flood & Conklin Mfg. Co.*, the Court dealt with claims involving fraud in the inducement of the contract and

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[160] Shearson/Am. Express, Inc. v. McMahon, 482 U.S. 220, 222 (1987); Racketeer Influenced and Corrupt Organizations Act (RICO), 18 U.S.C. §§ 1961–1968 (1970).

[161] *Shearson/Am. Express*, 482 U.S. at 242.

[162] *Id.* at 238.

[163] Southland Corp. v. Keating, 465 U.S. 1, 11 (1984).

[164] *Id.* at 16.

[165] Dean Witter Reynolds, Inc. v. Byrd, 470 U.S. 213, 213 (1985).

[166] *Id.* at 217.

whether such claims were covered by the FAA.[167] The Court proceeded to make a distinction between claims involving fraud in the inducement of the arbitration provision, declaring that such issues were to be adjudicated by courts, while all other matters involving fraud in the inducement of the entire contract were to be referred to arbitration.[168] The Court used § 3 to direct the courts to only consider "issues relating to the making and performance of the agreement to arbitrate."[169]

[60]   Later, in *Rent-A-Center West, Inc. v. Jackson*, the Court expanded the principles laid out in *Prima Paint*.[170] In the so-called "delegation" clauses, the Court held that it is the arbitrator who must decide the challenge to the validity of the agreement to arbitrate unless the party files an objection to the assignment of arbitrability of such challenges to the arbitrator.[171] The Court also used the severability doctrine to enforce the particular section of the arbitration agreement being challenged to declare that this specific delegation was an agreement to arbitrate and thereby referring the matter to the arbitrator who was to decide all questions of arbitrability.[172]

[61]   Thus, since most claims are referable under the FAA,[173] it may be difficult to challenge an agreement of the parties to refer any disputes to an AI platform as not referable under § 3 of the FAA based solely on the non-human nature of such platforms.

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[167] Prima Paint Corp. v. Flood & Conklin Mfg. Co., 388 U.S. 395, 402 (1967).

[168] *Id.* at 403–04.

[169] *Id.* at 404.

[170] Rent-A-Center, W., Inc. v Jackson, 561 U.S. 63, 71 (2010).

[171] *Id.*

[172] *See id*. at 70–71 ("An agreement to arbitrate a gateway issue is simply an additional, antecedent agreement . . . and the FAA operates on this additional arbitration agreement just as it does on any other.").

[173] *See* Cornell & Co. v. Barber & Ross Co., 360 F.2d 512, 513 (D.C. Cir. 1966).

D. Can a Court Refuse to Order the Parties to Arbitration Based on § 4 of the FAA?

[62]   A party could seek to have the court determine that the arbitration agreement is at issue given the referral of the dispute to an AI platform. Section 4 allows a party to petition the court:

> for an order directing that such arbitration proceed in the manner provided for in such agreement . . . The court shall hear the parties, and upon being satisfied that the making of the agreement for arbitration or the failure to comply therewith is not in issue, the court shall make an order directing the parties to proceed to arbitration in accordance with the terms of the agreement.[174]

However:

> [b]efore compelling an unwilling party to arbitrate, § 4 therefore requires the court to engage in a limited review to ensure that the dispute is arbitrable—i.e., that a valid agreement to arbitrate exists between the parties and that the specific dispute falls within the substantive scope of that agreement.[175]

It is important to note that, while courts will conduct this review, such a review is limited by the statute. In *Will-Drill Resources v. Samson Resources* the court rejects the idea that it must "presume that there is valid contract and send any general attacks on agreement to arbitrator." [176] The court further explains that "[w]here the very existence of any agreement is disputed, it is for the courts to decide at the outset whether an agreement

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[174] 9 U.S.C. § 4.

[175] PaineWebber Inc. v. Hartmann, 921 F.2d 507, 511 (3d Cir. 1990).

[176] Will-Drill Res., Inc. v. Samson Res. Co., 352 F.3d 211, 212 (5th Cir. 2003).

was reached, applying state-law principles of contract."[177] In order to compel arbitration in a securities case, brokerage firm, managers and former broker "need only establish the following: 1) the existence of an agreement to arbitrate; 2) arbitrable claims; 3) no waiver of the right to arbitration."[178]

[63]   Put simply, the inquiry under § 4 is whether there is a dispute concerning the negotiations and execution of the agreement for arbitration.[179] The "FAA's command that federal courts enforce arbitration agreements also assumes that 'the making of the agreement for arbitration . . . is not in issue,'" and, thus, "[w]hen the existence of a valid agreement to arbitrate is in dispute, courts must carefully analyze claims of invalidity."[180] Therefore, a party could assert that there was fraud, illegality in the inducement of the arbitration clause, which would be a question for the court to decide, while "illegality, fraudulent inducement, or repudiation of the principal contract does *not* operate to nullify an agreement to arbitrate."[181]

[64]   Hence, a party could challenge the execution of an arbitration provision that refers disputes to an AI arbitral platform based on § 4 grounds, which would allow the district courts to retain jurisdiction of the adjudication of the arbitration provision. However, these challenges are likely to fail if only based on the mere appointment of an AI platform to serve as an arbitrator.

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[177] *Id.*

[178] Dougherty v. Mieczkowski, 661 F. Supp. 267, 2273 (D. Del. 1987).

[179] 9 U.S.C. § 4.

[180] Quilloin v. Tenet HealthSystem Phila., Inc., 763 F. Supp. 2d 707, 714 (E.D. Pa. 2011), *rev'd*, 673 F.3d 221 (3d Cir. 2012) (citation omitted).

[181] Hamilton Life Ins. Co. of N.Y. v. Republic Nat'l Life Ins. Co., 408 F.2d 606, 610 (2d Cir. 1969); *see also* Doctor's Assocs. v. Distajo, 66 F.3d 438, 457 (explaining "[If the] 'arbitration clause was induced by fraud, there can be no arbitration….'").

E.   Can a Court Refuse to Enforce an Arbitration Award Rendered Through an AI Platform?

[65]   Another possible challenge could arise when an award is granted and the parties file requests to vacate or modify the award under §§ 9-11 of the FAA.[182] This section covers the enforceability of the arbitral award allowing the parties to file a petition with the court for an order confirming said "award, and thereupon the court must grant such an order unless the award is vacated, modified, or corrected as prescribed in sections 10 and 11 of this title."[183]

[66]   In *Hall Street Associates, L.L.C. v. Mattel, Inc.*, the Court confirmed the exclusivity of the grounds listed in the FAA for the prompt vacatur and modification of awards, but also held that the "[p]ower to vacate an [arbitration] award is limited."[184] Section 10 allows the courts to vacate an award under certain conditions, including "[c]orruption, fraud, or undue means," lack of impartiality or corruption of the arbitrators, misconduct or exclusion of evidence that is material to the dispute, and other conduct that is prejudicial to the parties.[185] Also, courts can vacate an award if arbitrators exceed "their powers, or so imperfectly executed them that a mutual, final, and definite award upon the subject matter submitted was not made."[186]

[67]   However, "courts are, expectedly, justified in exercising great caution when asked to set aside an arbitration award,"[187] which "is the

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[182] *See generally* 9 U.S.C. §§ 9–11 (outlining the different challenges to the execution of an arbitration).

[183] 9 U.S.C. § 9.

[184] Hall St. Assocs., L.L.C. v. Mattel, Inc., 552 U.S. 576, 584 (2008) (citing Wilko v. Swan, 346 U.S. 427 (1953)).

[185] 9 U.S.C. § 10.

[186] *Id.*

[187] Ormsbee Development Co. v. Grace, 668 F.2d 1140, 1147 (10th Cir. 1982).

product of the theoretically informal, speedy, and inexpensive process of arbitration, freely chosen by the parties."[188] For example, in *Kemper Corporate Services v. Computer Sciences*, the Court of Appeals held that the FAA: "allows vacatur of an [arbitration] award '[o]nly if the arbitrator acts outside the scope of his contractually delegated authority—issuing an award that simply reflects his own notions of economic justice rather than drawing its essence from the contract.'"[189] The Court of Appeals also held that courts "must sustain an arbitration award even if we disagree with the arbitrator's interpretation of the underlying contract as long as the arbitrator's decision draws its essence from the contract."[190]

[68]   The party seeking to vacate an arbitral award under § 10 faces a heavy burden. For instance, the party cannot rely on a claim that the arbitrator committed a serious error, as this is not enough.[191] Courts will only consider questions relating to whether the arbitrator interpreted the contract in a way that goes beyond the "contractually delegated authority" and "not whether he got its meaning right or wrong."[192] The rationale behind this approach is that courts will respect the freedom of the parties to negotiate their contracts, "regardless of a court's view of its (de)merits."[193] However, "judicial review of arbitration awards is narrowly limited and . . . an arbitration award will not be set aside unless it is completely irrational or evidences a 'manifest disregard for law.'"[194]

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[188] Andros Compania Maritima, S.A. v. Marc Rich & Co., A.G., 579 F.2d 691, 701 (2d Cir. 1978).

[189] Kemper Corp. Servs., Inc. v. Comput. Scis. Corp., 946 F.3d 817, 822 (5th Cir. 2020).

[190] *Id.* (quoting Timegate Studios, Inc. v. Southpeak Interactive, L.L.C., 713 F.3d 797, 802 (5th Cir. 2013).

[191] *See* Stolt-Nielsen S.A. v. AnimalFeeds Int'l Corp., 559 U.S. 662, 671 (2010).

[192] Oxford Health Plans L.L.C. v. Sutter, 569 U.S. 564, 569 (2013) (internal citations omitted).

[193] *Id.* at 564 (internal quotation marks omitted).

[194] Lee v. Chica, 983 F.2d 883, 885 (8th Cir. 1993) (internal citation omitted).

[69]   Section 11 of the FAA also provides a mechanism through which the courts can modify or correct the award in the event the arbitrator has made an "evident material miscalculation of figures or an evident material mistake in the description of any person, thing, or property referred to in the award."[195] Moreover, arbitral awards may be vacated if they have been rendered on matters not referred to the arbitrators, "unless it is a matter not affecting the merits of the decision upon the matter submitted" and "the award is imperfect in matter of form not affecting the merits of the controversy."[196] Finally, the courts have the authority to modify or amend the award based on an evaluation of the intent of the parties, to "promote justice between the parties."[197] Courts, however, will not modify or amend an award based on an "erroneous finding of fact or of misinterpretation of law"[198] or mere ambiguity in the opinion of the arbitrator, which could be an inference that the arbitrator exceeded his or her authority.[199]

IV. INNOVATION V. LAWYERS

[70]   I do not proclaim technical expertise in the intricacies of AI when writing these virtual and non-interactive pages. Also, my affinity to MIT's Center for Bits and Atoms is well known although it is a small part of the MIT world. Microscopically, my interaction with some of the scientists at

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[195] 9 U.S.C. § 11.

[196] *Id.*; *see* Karaha Bodas Co., LLC v. Perusahaan Pertambangan Minyak Dan Gas Bumi Negara, 500 F.3d 111, 115, n.1 (2d Cir. 2007) (Neither the 1958 Convention on the Recognition and Enforcement of Foreign Arbitral Awards ("New York Convention") nor the 1975 Inter-American Convention on International Commercial Arbitration ("Panama Convention") include rules that allow a party to vacate an award. US courts will not vacate arbitral awards that have been rendered in a foreign country as the party seeking to vacate that award must apply to the courts of the country where the award was issued.)

[197] 9 U.S.C. § 11.

[198] San Martine Compania De Navegacion, S.A. v. Saguenay Terminals, Ltd., 293 F.2d 796, 800 (9th Cir. 1961) (internal citations omitted).

[199] United Steelworkers of Am. v. Enter. Wheel & Car Corp., 363 U.S. 593, 598 (1960).

the Center is important in helping me understand the disconnection between innovation and lawyers. I can imagine a world where law school education is personalized. When law books and articles will be interactive based on Avatar-like AI platforms created specifically on the characteristics and profile of each author/professor. A world where a law student can be asked or pose questions as they read the book, article, or case, has the choice to immediately access all the reference materials and navigate the dialogue with the designed AI platform to the areas of his/her interest. Moving forward, a law student could propagate the level of virtual interaction to a streamed classroom setting or a formal educational environment, where each byte of read material will give the student points, eventually leading to certificates or degrees awarded. Grades will be replaced by accumulated petabytes. An educational paradise, where knowledge will be distributed through interaction and communities developed by educators and through a complete open-source connectivity of binary configurations, while memorization will be displaced by algorithmically gaming the skills of the Socratic method.

A. We Need Robust AI

[71]   Words and phrases like "knowledge-based approach," "natural language processing," "machine learning," "deep learning," "algorithms," "bots," and "neural networks" pertain to computer platforms and/or processes that are programmed to gather knowledge from data in a progressively evolving manner so that they can perform tasks. It is important, however, to highlight "robust AI", which is used to describe an AI program that dynamically adapts to amorphous data imported from various sources while maintaining reliability.[200] Jeremy Kepner of MIT's Lincoln Lab suggests that robust AI is needed:

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[200] Gary Marcus, *The Next Decade in AI: Four Steps Towards Robust Artificial Intelligence* 3 (Feb. 17, 2020), https://arxiv.org/ftp/arxiv/papers/2002/2002.06177.pdf [https://perma.cc/5TAW-Y89M] ("[I]ntelligence that, while not necessarily superhuman or self-improving, can be counted on to apply what it knows to a wide range of problems in a *systematic* and *reliable* way, synthesizing knowledge from a variety of sources such that it can reason *flexibly* and *dynamically* about the world, *transferring* what it learns in one context to another, in the way that we would expect of an ordinary adult.").

[72]   Basically, given that AI is a system, it has been shown to be trivial to adjust the input data in a way that is not perceivable to humans, but will cause the AI system to classify the data however you want. In other words, you could change a sentence in a document that would not change the meaning to a human but would have a huge impact on the decision made by an AI system.[201] Thus, we need robust AI.

B. The Film "2001: A Space Odyssey"

[73]   On April 26, 2018, I attended a presentation of Michael Benson's book, *Space Odyssey: Stanley Kubrick, Arthur C. Clarke, and the Making of a Masterpiece* at the MIT Media Lab.[202] The book chronicles the production of the 1968 film *2001: A Space Odyssey*, through interviews that Benson conducted of Kubrick's widow, Christiane, and Arthur Clarke, the author of the book.[203] Benson writes: "[t]he film's fusion of scientifically informed speculation, industrially supported design, technofuturism, and kaleidoscopic cinematic abstraction brought art and science together in ways never seen previously."[204] In listening to Benson, I realized that the 1968 movie was a game-changer because Hollywood subsequently shifted its production from western-style movies to films about space exploration and the future. Clarke's original book is a marvel of fictionalized science dealing with consciousness, sentience, and human interactions with machines.[205]

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[201] E-mail from Jeremy Kepner, Head & Founder, Mass. Inst. Tech. Lincoln Lab'y Supercomputing Ctr. (LLSC), to Dimitrios Ioannidis, Author (Jan. 18, 2019) (on file with author); *see also Dr. Jeremy Kepner (Supercomputing Center Head & Founder)*, MASS. INST. TECH., http://www.mit.edu/~kepner/ [https://perma.cc/T9NB-A3QS].

[202] *Space Odyssey: Stanley Kubrick, Arthur C. Clarke, and the Making of a Masterpiece*, MIT MEDIA LAB, https://www.media.mit.edu/events/space-odyssey-stanley-kubrick-arthur-c-clarke-and-the-making-of-a-masterpiece/ [https://perma.cc/WKC2-UCL7].

[203] *Id.*; 2001: A SPACE ODYSSEY (Stanley Kubrick Productions 1968).

[204] MICHAEL BENSON, SPACE ODYSSEY: STANLEY KUBRICK, ARTHUR C. CLARKE, AND THE MAKING OF A MASTERPIECE 433 (Simon & Schuster Paperbacks 2018).

[205] ARTHUR C. CLARKE, 2001: A SPACE ODYSSEY (Penguin Books 2016) (1968).

[74]   Despite having brief conversations and no leading actors, the film brought into the limelight the potential of creating machines with human-like characteristics. Neither the then-existing technology nor the equipment available in 1968 stopped Kubrick and Clarke from accurately transposing their fantasies to the big screen. As a consequence, and well before 2001, they were completely vindicated having created one of the greatest and most influential films ever made.[206] In hindsight, the 1968 film visually humanized AI quite accurately, where wiring, light bulbs, and a hidden mechanism could emulate the intellectual and emotional capacity of humans, and even beyond.

C. AI — A True Odyssey

[75]   In 2017, Thomas G. Dietterich gave his Presidential Address at the Association for the Advancement of Artificial Intelligence, etitled "Steps Toward Robust Artificial Intelligence."[207] Dietterich mentioned Professor Marvin Minsky's comments and the "contrast between the robustness of the human intellect and the brittleness of existing AI systems."[208] He also referred to comments Minsky made during an interview with John Brockman:

> What are the differences between human thinking and what computers do today? To me, the most striking difference is how almost any error will completely paralyze a typical computer program, whereas a person whose brain has failed at some attempt will find some other way to proceed. We rarely depend upon any one method. We usually know

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[206] *See 2001: A Space Odyssey (film)*, *supra* note 204.

[207] Thomas G. Dietterich, *Steps Toward Robust Artificial Intelligence*, AI MAG., Oct. 2, 2017, at 3, 3.

[208] *Id.* at 4.

several different ways to do something, so that if one of them fails, there's always another.[209]

Dietterich underlined two important aspects of robust AI: (1) robustness to the *known unknowns* (that is, robustness to aspects of the world for which we have models) and, (2) robustness to the *unknown unknowns* (that is, robustness to unmodeled aspects of the world).[210] He compared the vast improvements made in reducing the word error rate of Google's speech engine and the computer vision that assesses images that contain objects.[211] Dietterich also analyzed machine learning and the advances in reasoning methods along with many algorithmic innovations on applications such as self-driving cars, robotic surgical assistants, automated stock trading, and autonomous weaponry.[212]

[76]   While it is true, according to Dietterich, that "[a]ll of these high-stakes applications require robust artificial intelligence technology," it is equally true that "every AI system will need to act without having a complete and correct model of the world."[213] According to Deitterich, there is no perfect AI system, and we must be willing to tolerate some level of

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[209] JOHN BROCKMAN, THE THIRD CULTURE: BEYOND THE SCIENTIFIC REVOLUTION 156 (Touchstone 1996) (1995).

[210] *See* Dietterich, *supra* note 207, at 3.

[211] *Id.* at 4.

[212] *Id.* at 7–9.

[213] *Id.* at 9–10.

failure.[214]

D. 1984: An "Unusual Colloquium"

[77]   In May 1984, and about sixteen years after the making of the 1968 film *2001: A Space Odyssey*, the MIT Press published *The AI Business: The Commercial Uses of Artificial Intelligence*, edited by Professor Patrick H. Winston, Director of the Artificial Intelligence Laboratory of MIT, and Karen A. Prendergast.[215] Reflecting on AI, the editors noted the passion generated by the commercial and scientific value of AI, but also questioned whether "the field's promoters are pied pipers leading us to the disappointment of excessive expectations or missionaries beckoning us to almost inconceivable opportunity."[216] The 1983-1984 book is a smoothie of intellectual brilliance that captures the vision and the expectations of AI for generations to come. For instance, Winston was remarkably correct when he said, "[e]uphoria about the future of Artificial Intelligence is in the air. But we must be certain to balance that euphoria with reality. It will take

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[214] *Compare* Dieterich, *supra* note 207, at 20 (implying that failure in AI systems should be expected since a "model of everything" cannot exist, yet "existing systems fail primarily because they have a model of almost nothing."), *with* Emmanuel Gaillard, *The Myth of Harmony in International Arbitration*, 34 ICSID REV. 553, 554 (2019) ("Perfect predictability will be achieved only when all decision makers (judges and arbitrators alike) are replaced by artificial intelligence—a scary prospect. Until then, a certain degree of chaos is necessary for evolution of a given system."). I agree with Gaillard's statement, except I would remove the word "Perfect," and I would also add that some level of "chaos" will continue to exist even with the implementation of the best AI platforms.

[215] THE AI BUSINESS: THE COMMERCIAL USES OF ARTIFICIAL INTELLIGENCE (Patrick Henry Winston & Karen A. Prendergast eds., 1984) [hereinafter THE AI BUSINESS] (containing a compilation of transcripts of presentations made at a 1983 forum which included members of the academia, some "hard core" financiers, people involved in industrial research, and others from the development side of technology, organized by MIT's Industrial Liaison Program and F. Eberstadt & Company, a prominent investment banking institution).

[216] *Id.*

time and hard work to transform the commercial potential of Artificial Intelligence into achievements."[217]

[78]   However, what has changed since 1983 other than technological successes in certain sectors? Are we close to making anything that remotely resembles Hal9000? Gary Marcus and Ernest Davis claim that "[t]rustworthy AI, grounded in reasoning, commonsense values, and sound engineering practice, will be transformational when it finally arrives, whether that is a decade or a century hence."[218] Essentially, a complete reaffirmation of what Winston said in 1983.[219]

[79]   Regardless of the time travel comparisons, what is disheartening is that the legal community was not invited to the 1983 forum, did not participate, and had no input in the context of framing the agenda, the topics, the issues, or the final manuscript of *The AI Business*.[220] Is the legal community now an integral part of the dialogue about AI, or does it continue to have the status of an observer? How far along have we come since the congressional hearings in 1923-24, during which Bernheimer referred to lawyers as an "economic wastage in the everyday commercial transactions"?[221]

1. AI Will Take a Long Time to Be Developed

[80]   There are many lessons to take from the 1983 MIT Forum. For example, Winston related the story of Lady Lovelace, the person that

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[217] *Id.* at 293.

[218] GARY MARCUS & ERNEST DAVIS, REBOOTING AI: BUILDING ARTIFICIAL INTELLIGENCE WE CAN TRUST 200 (Vintage Books ed. 2020).

[219] *See* THE AI BUSINESS, *supra* note 215, at 2.

[220] *See id.*

[221] *Joint Hearings on S. 1005 and H.R. 646*, *supra* note 32, at 6.

Charles Babbage used in 1842 to name the ADA programming language after:

> She was besieged by the press, wondering if Babbage's machines would ever be as smart as people. At that time, she intelligently denied it would ever be possible. After all, if you have to wait for a hundred years or so for it to happen, it is best not to get involved.[222]

Winston also described that, around 1960 several, "conscientious scientists talking about real possibilities" were predicting that computers would be as smart as people in ten years.[223] According to Winston, "[t]hey were simply trying to fulfill their public duty to prepare people for something that seemed quite plausible at the time."[224] Winston was frank about the topic of AI: "I like to call our present age the Age of the Entrepreneur. If there were substantial ideas about how to do impressive things as early as 1960, why have we waited until 1983 to have a conference about how Artificial Intelligence might be commercialized?"[225] During his presentation, Winston marveled through the advances of the time but continued to ask a timeless and relevant question, "[w]ill the commercialization of Artificial Intelligence be driven by need-pull or technology-push?"[226] In the end, Winston concluded that, "the correct attitude about Artificial Intelligence is one of restrained exuberance."[227]

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[222] *See* THE AI BUSINESS, *supra* note 215, at 2.

[223] *Id.* at 3.

[224] *Id.*

[225] *Id.* at 4.

[226] *Id.* at 11.

[227] *See* THE AI BUSINESS, *supra* note 215, at 13.

2. AI Platforms Cannot Succeed Without Implementation

[81]   Arnold Kraft, Manager of External Relations at Digital Equipment Corporation, discussed the benefits of using the XCON system in their business operations, which was created to track "components in sensible physical locations and to connect everything together properly."[228] Kraft claimed that XCON had completed about 20,000 orders with 95-98% accuracy, which made it "an indispensable and effective business tool."[229] However, Kraft's presentation was more of a reality check on breaking technological barriers and rapidly moving into a world of creating expert systems that could handle simple tasks. Moreover, Kraft recognized a "hostility" factor that has been and always will be an obstacle to the implementation of any new technology when he writes that "end users and programmers may resist accepting and using expert systems. Our solution is to deal with the psychological aspects of the change to new technology and to train them meticulously."[230]

3. AI is a "Moving Target Beginning to Grow Up" with Expected Failures

[82]   John Seely Brown, head of Xerox's Cognitive and Instructional Sciences, made some important points from the business model of developing AI:

> [T]here is another reason [besides that AI is now cost effective], more subtle, that is worth understanding because the real payoff in [AI] . . . [is] in commercially exploiting the artificial-intelligence mentality (a mentality for coping with ill-defined, constantly changing problems) and the

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[228] *Id.* at 41–42.

[229] *Id*. at 42.

[230] *Id.* at 47.

intelligent programming environments that have emerged to enable artificial-intelligence researcher [sic] to cope with immensely complex programs.[231]

Brown referred to the "computrons" and the nature of AI as a "moving target."[232] He suggested that there has to be a tolerance for some failures because the first "exploratory programming tools (and methodologies)" should be applied to a group of problems, even if they hardly demand AI processing.[233] Brown believed that there are different research approaches to dealing with AI, each having a different input variable, but in at least some cases there has to be "a synergy between current artificial-intelligence techniques and powerful engineering tools that already exist and that already contain true expertise."[234] He argued that AI requires the use of all research approaches but warns that we should "Proceed with Caution But Be Catholic" in structuring our exploration efforts.[235]

[83]   Another speaker, Paul M. Russo, General Manager of the Microelectronics Center at GE, said, "I see more of the same until there is a major breakthrough in our understanding of how humans deal with incomplete data, make decisions quickly, and react smoothly to unforeseen circumstances."[236]

4. The Best Way to Predict the Future is to Invent it

[84]   Alan Kay, Chief Scientist and Vice-President of Atari Corporation,

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[231] *Id.* at 82.

[232] *See* THE AI BUSINESS, *supra* note 215 at 83.

[233] *See id.* at 85.

[234] *See id.* at 87.

[235] *See id.* at 89–90.

[236] *Id.* at 223, 228.

centered his presentation on "Inventing the Future."[237] He outlined the pitfalls of predictability models and suggested that the future can be forecasted by inventing it: "The future is not laid out on a track. It is something that we can decide, and to the extent that we do not violate any known laws of the universe, we can probably make it work the way that we want to."[238] He did not include lawyers in the mix, but recommended an alliance of business people and scientists—despite his belief that they are "natural enemies" due to stylistic conflicts.[239] Kay reasoned that making money was a mutual goal, but there was an important divergence in the assessment of risk.[240] Fundamentally, Kay argued, there is risk aversion in the academic community which leads to difficulties in funding new research, while the entire process promotes "creative mendacity."[241] According to Kay, executives, although not unintelligent, do not exist in the same space as the technical people, if this is the case, funding that is "people" based rather than "project" oriented could yield better results .[242]

[85]   Kay explained that models are developed by guessing causal relationships and much is left out during the process.[243] For Kay, "[r]esearch often starts off with a noble failure."[244] For example, he detailed the history of the "Flex Machine" from 1967 to 1969, and how it ultimately failed

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[237] *See* THE AI BUSINESS, *supra* note 215 at 103.

[238] *Id.*

[239] *See id.*

[240] *Id.* at 103–04.

[241] *Id.* at 104 ("The NSF funding process almost requires researchers to write up the results of research done the year before as their proposals for new research, thus guaranteeing that they will have those results at the end of the actual funding year.").

[242] THE AI BUSINESS, *supra* note 215 at 105.

[243] *Id.* at 106.

[244] *Id.* at 107.

because it was marketed to "noncomputer professionals, such as doctors and lawyers who could not understand the somewhat arcane programming language . . . "[245] Additionally, Kay discussed the future of computers, stating "[c]omputers are going to disappear as physical objects. They will disappear into the wiring of our houses and into the clothes that we wear."[246] He also warned that market analysis does not predict the future, as it "has failed to predict all of the interesting and high-impact technological innovations of the twentieth century because it tends to look at trends."[247] He referenced two human qualities, communication and fantasy, "without which we cannot be human," but he also stated that there are no signposts in AI.[248]

5. Narrow Systems That Do Not Learn

[86]   Minsky outlined the problems with AI and what he referred to as "the promise of the future."[249] He described the existing "expert systems" as "narrow" because they are designed and produced for certain purposes, without any intelligence because they cannot learn, and they have no common sense.[250] He criticized the Industry, asserting that the Industry will not be able to do even simple research on AI:

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[245] *Id.*

[246] *Id.* at 108.

[247] THE AI BUSINESS, *supra* note 215 at 110–11.

[248] *See id.* at 111–12 ("[W]hen we find something, it is greeted with curious reactions … But getting to that right way requires a strong combination of powerful tools and a kind of intuition only a few people possess. The amount of leverage that a person has depends greatly on the kinds of systems that he uses.").

[249] *See generally id.* at 244, 246, 250 (explaining the problems with artificial intelligence and its promises).

[250] *Id.* at 244; *see also* MARCUS & DAVIS, *supra* note 218, at 13, 18 (describing current AI programs as "narrow" as well).

> They do not make machines that learn. They do not work on
> the simplest problems of common sense. In general they are
> not working on the kinds of things that ten years from now
> could produce a new wave of intelligent systems, just as the
> current wave of expert systems comes from the basic
> research done in the mid-1960s.[251]

Minsky also remarked, "[g]enerally I am discouraged with what happens
when large companies get involved. They do not seem to understand where
the ideas came from and where the new ones will come from in another
decade."[252]

6. The Corporate World has Different Goals

[87]   Venture Capitalist Frederick R. Adler, Managing Partner of the
Adler & Company, related the vibes of the business world very crisply: "I
have heard thirty definitions of Artificial Intelligence, all of which seem
contradictory. Not only do they seem contradictory, but I do not think I can
make money out of any of them."[253] Focused on the monetization of these
ideas, Adler concentrated on the timing lag that is inherently present in these
ideas because, as he suggested, they do not turn out money as fast as the
money they take in.[254]

[88]   Adler zeroed in on the mandate of profitability that applies to any
business, including AI, which to him appeared to be an undefined area. For
Adler, the opportunity was in finding solutions in *major problem* areas,
where AI can be used effectively, and which investors will buy into because
of the potential returns. Even though he was in the presence of exceptional
scientists and executives, Adler appeared to be the voice looking at the

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[251] THE AI BUSINESS, *supra* note 215, at 248.

[252] *Id.* at 251.

[253] *Id.* at 255.

[254] *Id.* at 256 ("I think we know which race tracks to go to, but I am not sure which horses
are going to win").

investment side of things: "If the motive is to bring Artificial Intelligence into the 1980s, or something romantic like that, that is wonderful, but if not done at a profit, it will not happen. It is a waste of time."[255]

E. 2022: The Odyssey Continues for AI

[89]   It may be fitting here to mention Homer's *Odyssey,* not only due to the mythicization of Ulysses' journey from Troy to Ithaca, but also with regard to the notion that reaching Ithaca was consequential to the journey itself.[256] So, have we reached the *Ithaca* of AI, and if not, how close are we? To answer these questions, this section discusses some scientific breakthroughs that will shape the future development of AI, including inventions in the areas of new materials, cell formation, and bionic senses. These discoveries show that we are well into a path of profound technological advances—a taste of the future. Furthermore, getting to know the scientists behind these amazing inventions may prompt lawyers to shake off their indifference to innovation so that it does not become a terminal condition.

1. 3D Printing Human Cells

[90]   On March 25, 2019, Filippos Tourlomousis and other scientists from the MIT Center for Bits and Atoms published, "Machine learning metrology of cell confinement in melt electrowritten three-dimensional biomaterial substrates."[257] In simple terms, the MIT scientists described an innovation

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[255] *Id.* at 260.

[256] *See generally* HAROLD BLOOM, HOMER'S ODYSSEY: BLOOM'S NOTES 5 (1996) (explaining the premise of Homer's *Odyssey*).

[257] Filippos Tourlomousis et al., *Machine Learning Metrology of Cell Confinement in Melt Electrowritten Three-Dimensional Biomaterial Substrates*, 5 MICROSYS. & NANOENG'G 1, 1–2 (2019) ("The principle of controlling cell function through cell shape manipulation has led to the development of engineered culture models made from natural or synthetic polymers. . . . The biological relevance of the fabricated substrates is demonstrated by culturing human adherent cells on stiff substrates with varying dimensionality and architecture.").

whereby they were able to 3D print a mesh/scaffold, using the "melt electrowriting" technique, allowing them to control the growth of cells in ways that they kept them uniform in shape, size, and functionality.[258]

[91]   While this technology is in the early stages of development, the MIT scientists used machine learning methods to "quantitatively assess and classify the effect of geometrical confinement on human adherent cells across different fibrous substrates dimensionalities and architectures."[259] In other words, they were able to extract the data from their experiments and then feed that information to a machine learning algorithm that in turn was trained to sort the cells' phenotypes, such as their physical form and structure, their developmental stages, and the cells' behavior.[260] By doing so, the scientists discovered that cells can detect the physical attributes of their micro-world, and over time, could adapt their physical qualities to their function—suggesting an intimate link between their shapes and functionality.[261]

[92]   The next inquiry is whether cells could someday be 3D printed to various shapes and functionality—serving as the building blocks for human organ systems. Such an event will eventually do away with the long list of people waiting for an organ transplant, and it will eliminate the possibility of rejection, as the 3D printed organs could be made using the cells of the patient.[262] According to Andreas Mershin of MIT, this is already

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[258] *Id.* at 2.

[259] *Id.* at 13.

[260] *See id.* at 2.

[261] *Id.* at 1 ("The technology platform established here constitutes a significant step towards the development of integrated additive manufacturing—metrology platforms for a wide range of applications including fundamental mechanobiology studies and 3D bioprinting of tissue constructs to yield specific biological designs qualified at the single-cell level.").

[262] *See Organ Donation Statistics*, HEALTH RES. & SERVS. ADMIN., https://www. organdonor.gov/statistics-stories/statistics.html#waiting-list [https://perma.cc/YD42-BMCR] (illustrating that 106,560 people are on the national transplant waiting list).

successfully demonstrated in the laboratories working with animal models and humans might be less than a decade away from being able to make viable, custom, personalized human organs on demand.[263]

[93]   The introduction to this article referred to the "cybersapiens" of the future: a mixture of machine gadgetry with implanted 3D printed human-like brain cells that power AI platforms of the distant future.[264] And while it may seem frightening at first, the bigger picture of "keep[ing] our eyes focused on the fundamental questions," as Minsky suggests, commands us to reboot our principles so that the fears of the "unknown unknowns," as Dietterich remarks, do not take over what we can control easily.[265]

2. The Search for Better Materials

[94]   In 1943, Warren S. McCulloch and Walter H. Pitts suggested a mathematical model of an artificial neuron,[266] which served as a demarcation of the operating infrastructure of a biological neuron.[267] In the summer of 1958, Frank Rosenblatt published an article in the Research Trends of Cornell University titled "*The Design of an Intelligent*

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[263] E-mail from Andreas Mershin. Rsch. Scientist, Mass. Inst. Tech., to Dimitrios Ioannidis (Sept. 27, 2020, 2:04 PM) (on file with author); *see Growing human Organs-on-a-Chip*, ROCHE (Feb. 27, 2022), https://www.roche.com/stories/organs-on-a-chip-technology-in-research-technologies [https://perma.cc/MS2Y-CHQ9?type=image].

[264] *See supra* Part I; *see also* Dinusha Mendis & Ana Santos Rutschman, *3D printing of body parts is coming fast – but regulations are not ready*, THE CONVERSATION (Jan. 10, 2020, 8:44 AM), https://theconversation.com/3d-printing-of-body-parts-is-coming-fast-but-regulations-are-not-ready-128691 [https://perma.cc/5X66-ABXE].

[265] Dietterich, *supra* note 207, at 3.

[266] Warren S. McCulloch & Walter Pitts, *A Logical Calculus of the Ideas Immanent in Nervous Activity*, 52 BULL. MATHEMATICAL BIOPHYSICS 99, 100 (1943).

[267] *See* Jean-Christophe B. Loiseau, *Rosenblatt's perceptron, the first modern neural network*, TOWARDS DATA SCI. (Mar. 11, 2019), https://towardsdatascience.com/rosenblatts-perceptron-the-very-first-neural-network-37a3ec09038a [https://perma.cc/S78R-JPKL].

Automaton."[268] He claimed that the "Perceptron," a machine that he developed, was capable of sensing, recognizing, remembering, and responding "like the human mind" and "without any human training or control."[269] Minsky was critical of Rosenblatt's theories[270] and whether the "Perceptron" network could learn the simple logical XOR function. It is also important to note that Rosenblatt considered Minsky as "the loyal opposition."[271] Nevertheless, and partly the result of Minsky's criticism, the shortcomings of the "Perceptron" came to the forefront within a few years, and Rosenblatt's theories of "neural networks" were not materializing mostly due to the limitations of existing "materials" available in the 1950s.[272]

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[268] Frank Rosenblatt, *The Design of an Intelligent Automaton*, 6 RSCH. TRENDS CORNELL AERONAUTICAL LAB'Y 1 (1958).

[269] *Id; see generally IEEE Frank Rosenblatt Award*, IEEE AWARDS, https://corporate-awards.ieee.org/award/ieee-frank-rosenblatt-award/ [https://perma.cc/7LKU-VV7G] (showing Mr. Rosenblatt has achieved notoriety in his field by having awards named in his honor).

[270] MARVIN MINSKY & SEYMOUR A. PAPERT, PERCEPTRONS: AN INTRODUCTION TO COMPUTATIONAL GEOMETRY 252 (MIT Press, 2d ed. 1987) (correcting conclusions that applied to earlier theories about multilayered neural networks in this version of the book).

[271] Melanie Lefkowtiz, *Professor's perceptron paved the way for AI – 60 years too soon*, CORNELL CHRON. (Sept. 25, 2019), https://news.cornell.edu/stories/2019/09/professors-perceptron-paved-way-ai-60-years-too-soon [https://perma.cc/SF6W-QTPP].

[272] *Compare* MINSKY & PAPERT, *supra* note 271 (giving an example of how limited the image recognition capabilities of "Perceptron" were by today's standards), *with* Samuel Axon, *Samsung Galaxy S20 vs. iPhone 11 Pro: A deeper division lurks beneath the spec sheets*, ARS TECHNICA (Feb. 13, 2020, 11:40 AM), https://arstechnica.com/gadgets/2020/02/samsung-galaxy-s20-vs-iphone-11-pro-a-deeper-division-lurks-beneath-the-specs-sheets/2/#h1 [https://perma.cc/2BFD-WFR2] (showing the Samsung S20 phone screen contains 4.6 million pixels as opposed to early perceptron's 400-pixel image), *and* MARCUS & DAVIS, *supra* note 218, at 41–42 ("In retrospect, Rosenblatt had a good idea, but the actual systems he could feasibly build back then just weren't able to do much. But hardware was only part of the problem. In hindsight, machine learning also depends heavily on having large amounts of data, like pictures named with labels, and Rosenblatt didn't have much; there was no internet from which he could pull millions of examples.").

[95]   And then came Kenneth Cheung of NASA, formerly of MIT's Center for Bits and Atoms. In a paper, titled: "Digital Morphing Wing: Active Wing Shaping Concept Using Composite Lattice-Based Cellular Structures" Cheung and a team of MIT researchers, including Professor Neil Gershenfeld, the Director of the Center, described the basic premise of the discovery.[273] By using polymers and other cellular materials, the MIT group shifted the discovery focus on improving the "'performance of highly compliant—that is, 'soft'—robots and mechanisms . . . that are much lower weight, more tunable, and can be made to dissipate energy at much lower rates'" while maintaining the same qualities for stiffness.[274]

[96]   While the base material is a dense composite, the geometry of assembly is such that a finished and covered control surface can be manufactured with an average density of only twice the density of air $(1.2kg/m^3)$ compared to solid aluminum with over two thousand times higher density $(2,700kg/m^3)$ and that with comparable strength and superior flexibility.[275] They managed to do this because:

> Cellular solids are a relatively recent innovation in materials design, enabling access to previously inaccessible regions of the material property space, such as high strength and stiffness per weight at very low mass density. They are composed of an interconnected network of either beams or

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[273] Benjamin Jenett et al., *Digital Morphing Wing: Active Wing Shaping Concept Using Composite Lattice-Based Cellular Structures*, 4 SOFT ROBOTICS 33, 33–34 (2017) (contemplating wings in birds that allow for strength and flexibility, Cheung was led to the beginning stages of the "morphing wing.").

[274] David L. Chandler, *A new twist on airplane wing design*, MIT NEWS (Nov. 3, 2016), http://news.mit.edu/2016/morphing-airplane-wing-design-1103 [https://perma.cc/UX3J-KQRC] ("The 'skin' of the wing also enhances the structure's performance. It's made from overlapping strips of flexible material, layered somewhat like feathers or fish scales, allowing for the pieces to move across each other as the wing flexes, while still providing a smooth outer surface.").

[275] *See* Jenett et al., *supra* note 274, at 35.

plates, which form the edges and faces of cells that fill three-dimensional space.[276]

Cheung filed a patent application for the morphing materials and began working for NASA, while MIT licensed the technology to Airbus to begin testing it on wings of airplanes and other parts.[277] NASA also began research into new designs for wings that can transform their shape during the flight in response to weather conditions and to reduce the drag coefficient, which would ultimately lead to significant airplane efficiency.[278] The scientists built a prototype wing and tested it in the wind-tunnel, where it was shown that it has the same aerodynamic qualities of conventional structures, but with 1/10 of the weight.[279]

[97]   Airplanes of the future could take off to altitudes where the density of air is such that minimal engine thrust combined with the use of morphing wings would allow them to fly like birds: efficiently, quietly, and gracefully. The relevant question is how the new materials being developed will permit the incorporation of cellular materials into AI hardware so that they run in a "morphing" way.

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[276] *Id.* at 34–35.

[277] *See* Chandler, *supra* note 275.

[278] NASA's Ames Research Center, *NASA Designs Ultra-light Wings That Change Shape During Flight*, YOUTUBE (Nov. 10, 2016), https://youtu.be/RrJYV8bioIc [https://perma.cc/S27U-LXHY]; Jenett et al., *supra* note 274, at 46 ("Lessons from these experiments will be applied to complete aircraft with full flight controls using active elastic deformation.").

[279] Chandler, *supra* note 275.

3. How to Artificially Mimic Our Senses Intelligently[280]

[98]   The invention of the "Artificial Nose" came after the Defense Advanced Research Projects Agency ("DARPA") launched a program called "Dog's Nose" to replace dogs in finding mines.[281] In 2007, DARPA relaunched a second phase of the program, "RealNose," as a result of the wars in Iraq and other places where the risk to American troops from the Improvised Explosive Devices ("IEDs") was greater than ever, resulting in considerable casualties.[282]

[99]   After being awarded a grant by DARPA, MIT's Andreas Mershin developed a "nose" type of a device, that could "smell" the explosive materials contained in these IEDs.[283] Mershin believes that:

> [e]vents and diseases and mental states leave reports in the air—ones that are intelligible to highly attuned olfactory systems but otherwise illegible to science. Smell, it appears, is sometimes the best way of detecting and discriminating between otherwise hidden things out in the world. And often, the *next*-best method of detecting that same thing is expensive (gas chromatography/mass spectrometry) or excruciating (tissue biopsies) or impossible (mind reading).[284]

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[280] *See* Sara Harrison, *The Quest to Make a Bot That Can Smell as Well as a Dog*, WIRED (May 16, 2019, 6:00 AM), https://www.wired.com/story/quest-to-make-robot-smell-cancer-dog/ [https://perma.cc/9LYM-3DKE].

[281] *See id.*

[282] *Id.*

[283] *Id.*

[284] *Id.*

Mershin's mentor at MIT, Shuguang Zhang, led the way in 2007 in mass-producing smell receptors.[285] Mershin built upon that success by developing a device that receives odorants and records responses, using a pattern-matching algorithm.[286] The "artificial nose" was performing better than dogs, but for Mershin, the nose is not an analytical tool but rather a mirror of the process that animals use to smell.[287]

[100] Zhang was also able to cultivate the olfactory receptors in a "biologically inert form," referring to the production of olfactory proteins in the test tubes, which gives them more stability and malleability than organic ones.[288] At the same time, Mershin and Zhang began exploring ways to train an AI system in managing data and making it a "smart" device:

> Ultimately, Mershin wants to see the Nano-Nose incorporated into your cell phone. He imagines using this intimate version of his device—one that rests at all hours against its owners' body—to collect longitudinal data about its wearer's health. Eventually, the nose would be able to alert you to get that mole on your thigh checked out, or warn you that your blood sugar is dropping dangerously low, or perhaps that you've started emitting the woody, musky odor of Parkinson's disease. The Nano-Nose could accompany you everywhere and keep tabs on you in ways that doctors never could. Everything that a dog can detect via smell, it would detect.[289]

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[285] Anne Trafton, *Sniffing out success*, MIT NEWS (Sept. 29, 2008), http://news.mit.edu/2008/smell-0929 [https://perma.cc/QVT7-RFJ6].

[286] *See* Harrison, *supra* note 281.

[287] *Id.*

[288] *Id.*

[289] *Id.*

This type of remarkable research makes the "artificial nose" a game-changer in the field of medicine given the importance of early detection of diseases.[290]

[101]   However, we must also come to terms with a vast array of consequences that will come about from detecting the information we leave in the air, especially that of our mental state. Aside from the privacy issues and the transparency standards that we will need to implement, the more difficult questions will relate to the probative value of the "smelly" information humans leave in the air, and whether it can be introduced at trials either before an arbitration tribunal or even a jury of our peers. Is that evidence admissible? Is it even evidence? Assuming that "smell" leaves a trail, how long does that trail last in the air? How can we measure it?

[102]   The future arbitrator may be an AI platform that uses the "artificial nose" or other similar devices to "smell" the credibility of witnesses or even the intent of the parties, in scientifically proven ways. Such use would be impossible for human arbitrators given the data implicated and the vast amount of processing required, but also because such evidence will be evaluated by AI platforms finetuned to be unbiased and trustworthy. Regarding the invasiveness of the "artificial nose", Mershin explained, "I would be very supportive of all the technologies that smell you. I would be very leery of technologies that want you to smell them . . . Don't let the phones start putting scents in your head. Bad idea."[291]

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[290] *See* Linda Marsa, *This Dog's Nose Is So Good at Smelling Cancer That Scientists Are Trying to Build One Just Like It*, LEAPS.ORG (Jan. 24, 2020), https://leapsmag.com/this-dogs-nose-is-so-good-at-smelling-cancer-that-scientists-are-trying-to-build-one-just-like-it/ [https://perma.cc/9KZR-YYSW].

[291] Harrison, *supra* note 281.

4. Google's AutoML[292] – A New Frontier in AI?

[103]   In a research paper published in March of 2020, Google engineers announced that they are working on a new AI platform that requires very little human input.[293] The AutoML ("automatic machine learning") process utilizes mathematical operations to seek out machine learning algorithms instead of expert-designed programs, thereby reducing human bias.[294] Current machine learning tools can search for data and identify certain patterns. However, one problem is that humans must create these algorithms, which in turn includes an unavoidable level of bias. The second problem is that it limits innovation because, "you cannot discover what you cannot search for."[295]

[104]   In the case of the AutoML Zero, the Google engineers are removing the possible element of human bias by letting the machine learning tools search on their own for these algorithms "using *little* restriction on form and *only* simple mathematical operations as building blocks."[296] Ultimately, the system compares algorithms while the top-performing ones are retrofitted with the characteristics of the best algorithms, and in a generational kind of a progression, the "mutated" ones mature to performance-based "bionic"

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[292] *World's best Go Player flummoxed by Google's 'godlike' AlphaGo AI*, THE GUARDIAN (May 23, 2017, 6:29 AM), https://www.theguardian.com/technology/2017/may/23/alphago-google-ai-beats-ke-jie-china-go [https://perma.cc/ZNJ3-L7SJ] ("A Google algorithm has narrowly beaten the world's best player in the ancient Chinese board game of Go, reaffirming the arrival of what its developers say is a groundbreaking new form of artificial intelligence").

[293] *See* Edd Gent, *Artificial Intelligence is evolving all by itself*, SCIENCE (Apr. 13, 2020), https://www.sciencemag.org/news/2020/04/artificial-intelligence-evolving-all-itself [https://perma.cc/U64L-FNST]; Esteban Real et al., *AutoML-Zero: Evolving Machine Learning Algorithms From Scratch*, ARXIV (June 30, 2020), https://arxiv.org/pdf/2003.03384.pdf [https://perma.cc/A9YP-PQUH].

[294] Real et al., *supra* note 294, at 1.

[295] *Id.*

[296] *Id.*

algorithms.[297] The importance of this new direction is that AutoML has "reproduced decades worth of human-led AI discoveries in only days."[298]

5. We Have an AI platform That Can Serve as an Arbitrator.

[105]   In January of 2019, Karen Hao of the MIT Technology Review discussed the results of a survey of 16,625 papers to predict the direction of AI, explaining that, "[m]any of the techniques used in the last 25 years originated at around the same time, in the 1950s, and have fallen in and out of favor with the challenges and successes of each decade."[299] That, according to Hao, is a clear indication that the evolution of AI is paradoxically uncertain, not because of technological inefficiencies, but because of the "fickleness of the quest to duplicate intelligence."[300] On the

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[297] *See* Gent, *supra* note 295 (explaining the new process allows the AutoML program to find "algorithms using a loose approximation of evolution. It starts by creating a population of 100 candidate algorithms by randomly combining mathematical operations. It then tests them on a simple task, such as an image recognition problem where it has to decide whether a picture shows a cat or a truck."); *see also* Jake Anderson, *Google Scientists Are Creating An Artificial Intelligence That Evolves on Its Own*, THE MIND UNLEASHED (Apr. 21, 2020), https://themindunleashed.com/2020/04/google-scientists-artificial-intelligence-evolves-on-its-own.html [https://perma.cc/KWJ4-NKKP] ("Even more stunning is their claim that they can induce 'mutations' into new generations of algorithms, which mimics principles of Darwinian evolution, namely 'survival of the fittest.'").

[298] Anderson, *supra* note 298; *see also* Will Douglas Heaven, *Meta's new learning algorithm can teach AI to multi-task*, MIT TECH. REV. (Jan. 20, 2022), https://www.technologyreview.com/2022/01/20/1043885/meta-ai-facebook-learning-algorithm-nlp-vision-speech-agi/ [https://perma.cc/S4A7-E6AK] (reporting Meta AI invented an algorithm called Data2vec that can teach AI to multi-task via research that "builds on an approach known as self-supervised learning, in which neural networks learn to spot patterns in data sets by themselves, without being guided by labeled examples").

[299] *See* Karen Hao, *We analyzed 16,625 papers to figure out where AI is headed next*, MIT TECH. REV. (Jan. 25, 2019), https://www.technologyreview.com/2019/01/25/1436/we-analyzed-16625-papers-to-figure-out-where-ai-is-headed-next/ [https://perma.cc/4C9M-775B].

[300] *Id.*

surface, Hao appears to make sense, and her conclusions are reasonable; however, she incorrectly uses a strict mathematical and statistical approach. Kay described this very same principle in the 1983 MIT conference when he alluded to the pitfalls of predictability models suggesting that the "best way to predict the future is to invent it."[301] Thus, looking at the past to predict the future does not work well given the exponential growth we observe in all aspects of human inventiveness.

[106] But will humans ever be able to duplicate intelligence? Stephen Thaler of Imagination Engines claims that we currently have the technology to conduct arbitrations using an AI platform.[302] During the early years of working with AI platforms, Thaler was interested in creating technology that could generate new ideas and plans of action, interpreting natural language.[303] In 1994, he developed the "Creativity Machine," a replica of the brain which "functionally consists of only neurons, synaptic interconnects, and a form of long range chemical connectionism represented, for example, by the endocrine system."[304] Thaler claims that we can replicate cognition by imitating the biological neural networks of the brain.[305] According to Thaler, this discovery along with the use of

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[301] *See* THE AI BUSINESS, *supra* note 215, at 103.

[302] E-mail from Stephen Thaler, President & Chief Exec. Officer, Imagination Engines, Inc., to Dimitrios Ioannidis (June 24, 2020, 11:51 AM) (on file with author); s*ee also* Aditya Singh Chauhan, *Future of AI in Arbitration: The Fine Line Between Fiction and Reality*, KLUWER ARB. BLOG (Sept. 26 2020), http://arbitrationblog.kluwerarbitration. com/2020/09/26/future-of-ai-in-arbitration-the-fine-line-between-fiction-and-reality/ [https://perma.cc/7DL7-CU5Q].

[303] *See* Stephen L. Thaler, *The Creativity Machine Paradigm: Withstanding the Argument From Consciousness*, 11 APA NEWSL. ON PHIL. & COMPUTS. 19, 25 (2012).

[304] *Id.*

[305] *Id.*

extremely fast processing, can lead to generating art, inventions, and discoveries.[306]

[107]   Furthermore, Thaler suggests that it is possible to design machines that not only have consciousness, but also the ability to have thoughts about their thoughts.[307] Several years after developing the "Creativity Machine", Thaler created DABUS ("Device for the Autonomous Bootstrapping of Unified Sentience").[308] DABUS is different from its predecessor because it "goes beyond mere design optimization, now allowing machine intelligence to fully conceptualize. This new capability places this patent squarely in the debate as to whether inventive forms of AI can own their own intellectual property."[309] Indeed, although the application was ultimately denied, the Artificial Inventor Project team recently filed two patent applications on behalf of DABUS for, "inventions generated autonomously by an artificial intelligence (AI) under circumstances in which we believe that no natural person, as traditionally defined, qualifies as an inventor. These applications list the AI as the inventor and the AI's owner as the patent applicant and the

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[306] *See id.* at 20 ("While not generating a concerto, it has achieved the equivalent by spontaneously authoring an album of original musical tunes (Thaler 2007) that are capable of passing the equivalent of a 'musical Turing test,' after being mentored not by 'if-then-else' heuristics or tedious statistical studies, but by the detection of the raw emotions on its audience's face.")*; see* Letter from U.S. Copyright Office Review Board, to Ryan Abbott, Esq., Brown, Neri, Smith & Khan, LLP (Feb. 14, 2022), https://www. copyright.gov/rulings-filings/review-board/docs/a-recent-entrance-to-paradise.pdf [https://perma.cc/HP5L-BPSS] (affirming the denial to register a two-dimensional artwork authored by the Creativity Machine).

[307] Thaler, *supra* note 304 at 24.

[308] *Id.* at 40, 42 nn.1–3 (2019).

[309] *Id.* at 42.

prospective owner of any issued patents."[310]

[108]   The key to DABUS's success is its architecture which comprises many neural nets that each contain "interrelated memories, perhaps of a linguistic, visual, or auditory nature."[311] The process involves successive cycles of noise injection and retraction that ripen complex concepts encoded as geometrical chains of neural nets.[312] This progression of notions is tantamount to a stream of consciousness.[313]

F. AI in 2022 – The Business View

[109]   Gary Marcus, CEO of Robust AI, a company vying to create a new "Foundation for the Future of Robotics", criticizes the current efforts on deep learning.[314] Following in the footsteps of Minsky, Marcus and Davis

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[310] *See In re* U.S. Patent Application No. 16/524,350, 2020 Dec. Comm'r Pat., https://www.uspto.gov/sites/default/files/documents/16524350_22apr2020_1.pdf [https://perma.cc/76CH-YJ9N] (denying the patent applications of DABUS, the artificial intelligence system created by Stephen Thaler); Abbott, *supra* note 97. *Cf.* Naruto v. Slater, 888 F.3d 418, 420 (9th Cir. 2018) (holding that animals cannot claim proprietary rights); s*ee also* Kirk Hartung, *DABUS Sent Back to Drawing Board Following Reversal of Inventorship Decision by Australia Court*, IPWATCHDOG (Apr. 17, 2022, 12:15 PM), https://www.ipwatchdog.com/2022/04/17/dabus-sent-back-drawing-board-following-reversal-inventorship-decision-australia-court/id=148464/ [https://perma.cc/7LVA-UL4T].

[311] *DABUS Described*, IMAGINATION ENGINES INC., http://imagination-engines.com/iei_dabus.php [https://perma.cc/2LBX-ST2Z].

[312] *Id.*

[313] *Id.* ("If per chance one of these geometrically represented ideas incorporates one or more desirable outcomes, these shapes are selectively reinforced . . . while geometries representing undesirable notions are weakened through a variety of mechanisms. In the end such ideas are converted into long term memories, eventually allowing DABUS to be interrogated for its cumulative inventions and discoveries.").

[314] *See Robust.AI*, CRUNCHBASE, https://www.crunchbase.com/organization/robust-ai#section-funding-rounds [https://perma.cc/RWP9-GZ5L] (highlighting Robust AI was funded in June of 2019 by Fontinalis Partners and Playground Global); *see* MARCUS & DAVIS, *supra* note 218.

claim that current AI programs are "narrow" because, essentially, they cannot understand the meaning of things and they cannot be trusted because they cannot work outside the context of how they were designed.[315] Marcus and Davis also believe that despite significant investment in AI technology, the current AI trajectory appears to lead us to "solutions that are brittle, cryptic, and too unreliable to be used in high-stakes problems."[316] Marcus and Davis suggest broad intelligence programs, which means building a "fundamentally open-ended" world, where AI can deal with novel problems and variations that may creep up.[317]

[110] When applying their approaches to the law, many questions arise. For example, can an AI platform understand the terminology and use of "precedent"? Can an AI platform understand human behavior that may explain a breach of a contract? Can an AI platform make logical conclusions when it has incomplete or inconsistent evidence, or can an AI platform ask questions that will allow it to probe the validity of the evidence presented? According to Marcus and Davis, "[t]he core issue is that current AI systems mimic input data, without regard either to social values or to the quality or nature of the data."[318] However, a lot of legal application requires assessing social values and the quality and nature of the evidence.

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[315] MARCUS & DAVIS, *supra* note 218 ("[I]n five fundamental ways, our human brains still vastly outperform our silicon counterparts: we can understand language, we can understand the world, we can adapt flexibly to new circumstances, we can learn new things quickly (even without gobs of data), and we can reason in the face of incomplete and even inconsistent information. On all of these fronts, current AI systems are non-starters.").

[316] *Id.*

[317] *Compare id.* ("AI that is powered by deep understanding will be the first AI that can learn the way a child does, easily, powerfully, constantly expanding its knowledge of the world, and often requiring no more than one or two examples of any new concept or situation in order to create a valid model of it."), *with* THE AI BUSINESS, *supra* note 215, at 246 ("If you look superficially at these children, they look as if they are playing. But if you look closely at slow-motion videotapes, you will see that a child is a little scientist making hypotheses. The process is extensive, meticulous, and goes on for hours a day for several weeks.").

[318] *See* MARCUS & DAVIS, *supra* note 218.

[111]   Marcus and Davis explain how, "[t]he ultimate, of course, is a machine that can teach itself to be an expert, in any domain. That too will come, in time."[319] Minsky said something similar in 1983:

> Everywhere there are a lot of people interviewing experts and writing down rules of how they work, and that is a valuable part of understanding how experts work. But it is important to make machines that learn by experience, that themselves interview experts and find out how they work, and do it themselves, and read books, and embody the things that make people so smart.[320]

This simple comparison reinforces Hao's point that AI methodology has not changed much during the last 40 years.[321] Yet, it also underscores the importance of recalibrating several areas of social synergy that appear to be failing in the context of innovation.

1. What Comes First, Innovation, or Legislation?

[112]   Many scientists express frustration in that innovation is often stymied because there is no legislative framework to guide them in what they can work on and develop. Vijay Gadepally of the Lincoln Lab of MIT believes that legislation must come first so that innovation can follow within the socially set parameters.[322] This is easier said than done as legislating emerging technologies is challenging when there is not a full understanding of all the implications and nuances and there is no social activity other than

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[319] *Id.*

[320] *See* THE AI BUSINESS, *supra* note 215, at 252.

[321] *See* Hao, *supra* note 300.

[322] *See* Vijay Gadepally & William Streilein, *AI Data and Model Economy (AIDME)*, MASS. INST. TECH. (2019), https://vijayg.mit.edu/sites/default/files/documents/MITLL-AIDAME.pdf [https://perma.cc/B5L9-KZG2].

what is being done in the lab. Such issues may not be ripe for legislative resolution or social trendsetting.

[113]   However, does it make sense to have a legislative framework in place before scientists start implementing inventions in the real world? Or are the existing laws sufficient to deal with emerging technologies? The panelists at JPMorgan's Chase Optimization and the Path to Innovation Group conference in Philadelphia on March 4, 2020, identified this very same problem:

> For artificial intelligence and machine learning technology to properly work, there needs to be a large amount of diverse data plugged into it. However, the data plugged into the machines may be biased and new data privacy laws coming from the different states are beginning to impact how artificial intelligence is used.[323]

These issues confirm the disconnection and considerable inefficiency in how we manage innovation. Scientists proceed in completely different paths from legislators without much synchronization, while lawyers tend to maintain the status of an observer during the early phases. This is a phenomenon that continues to occur when we all know that these paths will inevitably crisscross and possibly clash. Garry Mathiason, the co-chair of the Robotics, AI, and Automation Industry Group at Littler Mendelson in San Francisco, referred to this issue:

> There's no way for workplace laws, regulations and court decisions to keep up with the technological changes . . . Members of the bar are called upon to provide soft-law advice and solutions that will bridge the gap between today's

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[323] Dan Clark, *Allow Artificial Intelligence to Supplement Decisions, Not Make Them*, LAW.COM (Mar. 4, 2020, 4:33 PM), https://www.law.com/corpcounsel/2020/03/04/allow-artificial-intelligence-to-supplement-decisions-not-make-them/ [https://perma.cc/4KUA-KTF2].

workplace decisions and tomorrow's review of those decisions by courts, regulators and legislators.[324]

Kay identified the "natural enemies" concept in 1983 and the stylistic conflicts between scientists and business leaders, but I suggest this conceptual conflict also includes lawyers. But how can we merge these divergent interests so that they operate in concert? And why should we? The answer to the first question was given by Kraft in 1983 when he said that "[the] solution is to deal with the psychological aspects of the change to new technology and to train them meticulously."[325] It all starts from developing a truly interdisciplinary approach to legal education and practice. Lawyers should become the active connectors between innovators and legislators, reinforcing a process that involves cooperation at all levels from the get-go. This is not happening now. As Minsky said, it is time to think "more deeply" and "keep our eyes focused on the fundamental questions."[326] In my view, this means a more "morphing" law school curriculum that is truly "robust" and will be implemented thereafter in our professional workspace. Furthermore, we must merge these divergent interests because managing innovation will remove the social inefficiencies we currently witness between innovation and legislation. This will not only help lawyers ride the global technological train, but more importantly, it will allow future lawyers to lead the innovative legislative agenda, which will boost innovation even more.

2. Follow the Money to See Where AI Will Land

[114]   Omdia, a technology research company established in 2019 when several companies merged to create a global platform of information,

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[324] *See* Julie Sobowale, *How artificial intelligence is transforming the legal profession*, ABA J. (Apr. 1, 2016, 12:10 AM), https://www.abajournal.com/magazine/article/how_artificial_intelligence_is_transforming_the_legal_profession [https://perma.cc/5K38-HNEW].

[325] *See* THE AI BUSINESS, *supra* note 215, at 47.

[326] *See* Dietterich, *supra* note 207.

recently predicted that the budget for AI software for the retail industry in 2025 will be about $9.8 billion, up significantly from the $1.3 billion in 2019.[327] This surge will be seen in the "supply chain and inventory management software . . . followed by AI-based applications in image recognition and visual search . . . virtual digital assistants fine-tuned for the needs of eCommerce . . . video surveillance analytics . . . and tools that enable personalized customer journeys."[328]

[115] In predicting the future allocation of resources, the National Academies of Sciences, Engineering, and Medicine ("NASEM") published a report in 2017 on the possible impact of automation and other technologies on the U.S. workforce, with some remarkable conclusions.[329] It detailed the state of current technological developments stating, "[w]e are moving from an era where machines were blind, unable to recognize even simple objects, to an era where they can distinguish faces, read street signs, and understand the content of photographs as well as—or better than—humans."[330] The report also noted the unpredictability, complexity, and lack of interactivity

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[327] *Introducing Omdia: Informa Tech Launches New Research Powerhouse Following Acquisition of the Majority of IHS Markit's Technology, Media and Telecommunications Research Business to Connect the Dots for Customers Across the Tech Industry*, CISION PR NEWSWIRE (Feb. 5, 2020, 11:36 AM), https://www.prnewswire.com/news-releases/introducing-omdia-informa-tech-launches-new-research-powerhouse-following-acquisition-of-the-majority-of-ihs-markits-technology-media-and-telecommunications-research-business-to-connect-the-dots-for-customers-across-the-tech-in-300999593.html [https://perma.cc/BA5J-AMHW]; *see also* Max Smolaks, *Research: Retailers to spend $37.3bn on AI software between 2019 and 2025*, AI BUS. (Mar. 25, 2020), https://aibusiness.com/document.asp?doc_id=761255&site=aibusiness [https://perma.cc/6CTS-PUMK].

[328] Smolaks, *supra* note 328.

[329] NATIONAL ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE, INFORMATION TECHNOLOGY AND THE U.S. WORKFORCE: WHERE ARE WE AND WHERE DO WE GO FROM HERE? (National Academies Press 2017).

[330] *Id.* at 158.

between the participants making it difficult for governments to plan for the future.[331]

[116]   In their book, *The 4th Industrial Revolution - Responding to the Impact of Artificial Intelligence on Business*, Mark Skilton and Felix Hovsepian claim that AI moves technology to a more predictive and prescriptive model, which is a departure from the earlier analytical models.[332] Citing several studies, Skilton and Hovsepian conclude that there is a "wide range of industry adoption of AI technologies in several industries such as manufacturing, media and advertising, healthcare, BFSI, and transportation and automotive as the key factor supporting the growth of the AI market in the North American region."[333] Also, the expected growth exists in the sectors of nanotechnology, quantum computing along with "Additive Manufacturing," blockchain, and virtual reality.[334]

[117]   MarketsandMarkets is an international company that provides research on ways to identify new revenue opportunities and high growth emerging markets in AI, bolstering the notion that AI continues to grow.[335]

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[331] *Id.* at 159.

[332] MARK SKILTON & FELIX HOVSEPIAN, THE 4TH INDUSTRIAL REVOLUTION: RESPONDING TO THE IMPACT OF ARTIFICIAL INTELLIGENCE ON BUSINESS 30, 290 (Palgrave MacMillan ed. 2018) ("While historically the expectation of artificial intelligence has been repeatedly exaggerated, it is the evolution of computing languages and systems models with sensors and data that will continue to address challenges in defining AI and approaches to using AI effectively.").

[333] *Id.* at 34.

[334] *See id.* at 31, 40, 49.

[335] *See About Us*, MARKETSANDMARKETS, https://www.marketsandmarkets.com/ AboutUs-8.html [https://perma.cc/EY9U-DDCE].

Report Date	Market	Projected Growth in Billions $
June 2020	Healthcare with Covid-19	$67.4 by 2027[336]
April 2020	Agriculture	$4.0 by 2026[337]
Nov. 2019	Drug Discovery	$1.4 by 2024[338]
July 2019	Accounting	$4.8 by 2024[339]
May 2019	Cybersecurity	$38.2 by 2026[340]

[336] MARKETSANDMARKETS, ARTIFICIAL INTELLIGENCE IN HEALTHCARE MARKET BY OFFERING (HARDWARE, SOFTWARE, SERVICES), TECHNOLOGY (MACHINE LEARNING, NLP, CONTEXT-AWARE COMPUTING, COMPUTER VISION), APPLICATION, END USER AND GEOGRAPHY - GLOBAL FORECAST TO 2027 (Oct. 2021), https://www.marketsandmarkets.com/Market-Reports/artificial-intelligence-healthcare-market-54679303.html [https://perma.cc/A4HX-PDNG].

[337] MARKETSANDMARKETS, ARTIFICIAL INTELLIGENCE IN AGRICULTURE MARKET BY TECHNOLOGY (MACHINE LEARNING, COMPUTER VISION, AND PREDICTIVE ANALYTICS), OFFERING (SOFTWARE, HARDWARE, AI-AS-A-SERVICE, AND SERVICES), APPLICATION, AND GEOGRAPHY - GLOBAL FORECAST TO 2026 (Apr. 2020), https://www.marketsandmarkets.com/Market-Reports/ai-in-agriculture-market-159957009.html [https://perma.cc/P5TC-PE8M].

[338] MARKETSANDMARKETS, ARTIFICIAL INTELLIGENCE (AI) IN DRUG DISCOVERY MARKET BY COMPONENT (SOFTWARE, SERVICE), TECHNOLOGY (ML, DL), APPLICATION (NEURODEGENERATIVE DISEASES, IMMUNO-ONCOLOGY, CVD), END USER (PHARMACEUTICAL & BIOTECHNOLOGY, CRO), REGION - GLOBAL forecast TO 2024 (NOV. 2019), https://www.marketsandmarkets.com/Market-Reports/ai-in-drug-discovery-market-151193446.html [https://perma.cc/3WED-BEAS].

[339], MARKETSANDMARKETS, ARTIFICIAL INTELLIGENCE IN ACCOUNTING MARKET BY COMPONENT, DEPLOYMENT MODE, TECHNOLOGY, ENTERPRISE SIZE, APPLICATION (AUTOMATED BOOKKEEPING, FRAUD AND RISK MANAGEMENT, AND INVOICE CLASSIFICATION AND APPROVALS), AND REGION - GLOBAL FORECAST TO 2024 (July 2019), https://www.marketsandmarkets.com/Market-Reports/artificial-intelligence-in-accounting-market-122034791.html [https://perma.cc/ZR59-BMQF].

[340] MARKETSANDMARKETS, ARTIFICIAL INTELLIGENCE IN CYBERSECURITY MARKET BY OFFERING (HARDWARE, SOFTWARE, AND SERVICE), DEPLOYMENT TYPE, SECURITY TYPE, TECHNOLOGY (ML, NLP, AND CONTEXT-AWARE), APPLICATION (IAM, DLP, AND UTM), END USER, AND GEOGRAPHY- GLOBAL FORECAST TO 2026 (May 2019), https://www.marketsandmarkets.com/Market-Reports/artificial-intelligence-security-market-220634996.html [https://perma.cc/4Y5M-2F33].

January 2019	Manufacturing	$16.7 by 2026[341]
December 2018	Healthcare	$36.1 by 2025[342]
July 2018	Mobile	$17.83 by 2023[343]
June 2018	Supply chain market	$1.01 by 2025[344]
April 2018	Software Tools and Services, Machine Learning and Deep, Learning and Natural Language	$10.88 by 2023[345]

[341] MARKETSANDMARKETS, ARTIFICIAL INTELLIGENCE IN MANUFACTURING MARKET BY OFFERING (HARDWARE, SOFTWARE, AND SERVICES), TECHNOLOGY (MACHINE LEARNING, COMPUTER VISION, CONTEXT-AWARE COMPUTING, AND NLP), APPLICATION, END-USER INDUSTRY AND REGION - GLOBAL FORECAST TO 2026 (Apr. 2022), https://www. marketsandmarkets.com/Market-Reports/artificial-intelligence-manufacturing-market-72679105.html [https://perma.cc/T3PM-UX2G].

[342] *Artificial Intelligence in Healthcare Market Worth $36.1 Billion by 2025 – Exclusive Report by MarketsandMarkets*, PR NEWSWIRE (Dec. 17, 2018, 10:30 AM) https://www. prnewswire.com/news-releases/artificial-intelligence-in-healthcare-market-worth-36-1-billion-by-2025-exclusive-report-by-marketsandmarkets-tm--891319719. html [https://perma.cc/6LYP-ZFAY].

[343] MARKETSANDMARKETS, MOBILE ARTIFICIAL INTELLIGENCE (AI) MARKET BY APPLICATION (SMARTPHONES, CAMERAS, DRONES, AUTOMOTIVE, AR/VR, ROBOTICS, SMART BOARDS, AND PCS), TECHNOLOGY NODE (10NM, 20 TO 28NM, 7NM AND OTHERS), AND GEOGRAPHY - GLOBAL FORECAST TO 2023 (July 2018), https://www. marketsandmarkets.com/Market-Reports/mobile-artificial-intelligence-market-138681717.html [https://perma.cc/7PDH-GTJL].

[344] MARKETSANDMARKETS, ARTIFICIAL INTELLIGENCE IN SUPPLY CHAIN MARKET BY OFFERING, TECHNOLOGY, APPLICATION (FLEET MANAGEMENT, SUPPLY CHAIN PLANNING, WAREHOUSE MANAGEMENT, VIRTUAL ASSISTANT, FREIGHT BROKERAGE), END-USER INDUSTRY, AND GEOGRAPHY - GLOBAL FORECAST TO 2025 (June 2018), https://www.marketsandmarkets.com/Market-Reports/ai-in-supply-chain-market-114588383.html [https://perma.cc/ET2D-E2RL].

[345] MARKETSANDMARKETS, ARTIFICIAL INTELLIGENCE AS A SERVICE MARKET BY SERVICE TYPE (SOFTWARE TOOLS AND SERVICES), TECHNOLOGY (MACHINE LEARNING AND DEEP LEARNING, AND NATURAL LANGUAGE PROCESSING), ORGANIZATION SIZE, VERTICAL, AND REGION - GLOBAL FORECAST 2023 (Apr. 2018), https://www. marketsandmarkets.com/Market-Reports/artificial-intelligence-ai-as-a-service-market-121842268.html [https://perma.cc/5PP9-9YQV].

[118]   Also, in 2018, the MIT Sloan Management Review and the Boston Consulting Group issued the results of their survey of 3,076 executives in 29 industries and 126 countries.[346] There were several patterns: (a) companies are focusing on revenue rather than implementing cost-effective measures, and (b) aggressive implementation of scaling up of the AI applications.[347] Interestingly, 90% of these companies predicted that AI will support and modify their business models over the next 5 years.[348]

[119]   This all demonstrates that AI innovation is expected to explode in certain sectors in the coming years. However, despite the clear investment direction in AI, I do not believe there will be much of a spillover effect in supporting innovation in the legal profession. In fact, there are no reports in MarketsandMarkets' database outlining any expected growth patterns in AI for the legal profession, suggesting that business leaders are not interested in redirecting any significant investment dollars our way.

3. Possible Drivers of Innovation

[120]   *"What drives innovation?"* is the million-dollar question, but *"what drives innovation in law?"* is the billion-dollar question. Peter Diamantis describes "fear, curiosity, greed, and significance" as the "major motivators" of innovation encompassing human values and our

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[346] *See* Sam Ransbotham et al., *Artificial Intelligence in Business Gets Real: Pioneering Companies Aim for AI at Scale*, MIT SLOAN MGMT. REV. (Sept. 17, 2018), https://sloanreview.mit.edu/projects/artificial-intelligence-in-business-gets-real/ [https://perma.cc/W5MV-M9AN].

[347] *Id.*

[348] *Id.*

predisposition to compete.[349]

[121] Most lawyers are wired to compete, but Diamantis' theory of the major motivators runs into shallow ground when it comes to law. In the order of Diamantis' priority spectrum of motivators, there is a lot of curiosity in law, but it is unlikely that this relates to technologically improving our professional workspace. Instead, this encompasses the study of precedent, and applying the principles of the past to our caseload. Diamantis' second motivator is "extraordinary fear" but for lawyers, this means taking "calculated risks" in marketing our services, how we handle cases and clients, and generally how we deal with the entire adjudicatory process. This type of motivation should not be compared with the extraordinary fear that Diamantis describes, which is more like President Kennedy's space race with the Soviets, because the "Apollo program was executed at significant peril and tremendous expense in response to the early Soviet space successes."[350]

[122] Diamantis' third motivator consists of making money and generating wealth. Although this applies to lawyers, we are far from Diamantis' idea which is "best exemplified by the venture capital industry's backing of ten ideas, expecting nine to fail and hoping for one grand-slam winner."[351] Generally, this is not us, except perhaps lawyers who handle personal injury contingency or class action cases. Even then, though, most personal injury attorneys will evaluate liability, damages, and causation

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[349] PETER DIAMANDIS & STEVEN KOTLER, ABUNDANCE: THE FUTURE IS BETTER THAN YOU THINK 217 (Simon & Schuster 2011) ("If you need to accelerate change in specific areas, especially when the goals are clear and measurable, incentive competitions have a biological advantage. Humans are wired to compete. We're wired to hit hard targets."); *see also Keynotes*, DIAMANDIS, https://www.diamandis.com/keynotes [https://perma.cc/YR2T-3WJA] (noting that Diamandis was recently "named by Fortune Magazine as one of the 'World's 50 Greatest Leaders.'" Diamandis is the founder and executive chairman of the XPRIZE Foundation, which leads the world in designing and operating large-scale incentive competitions).

[350] DIAMANDIS & KOTLER, *supra* note 350.

[351] *Id.*

carefully, and will handle cases that tend to have a reasonable chance of recovery.

[123]   Diamantis' fourth motivator also applies to lawyers because we generally seek to make our lives matter and to make a difference at all levels of the social spheres. However, this factor alone is insufficient to drive us to innovate our practice areas. At the risk of offending many members of our profession, I quote the answer Adler gave to a question from the audience during the 1983 MIT conference, but substitute the word "doctors" with "lawyers":

> The systems that we turned down, in my judgment, were too brittle. They gave yes-no answers, leaving us concerned that [lawyers] would not use them because there was no role for the [lawyer]. I have not met a [lawyer] yet, anymore than I have met a venture capitalist, whose ego is small enough to handle that.[352]

4.   Trends in Shaping the Future of AI in the Legal Profession

[124]   The topic of AI "Affecting the Legal Profession" was on the agenda at the 93rd Annual National Conference of Bankruptcy Judges in 2019 in Washington, D.C.:

> Artificial Intelligence and its growth need not be feared. AI is not beating humans when it comes to many legal skills and tasks. Whether for data analytics or for streamlined legal research, the use of AI can keep client costs down. Some even theorize that the failure to use AI could be considered malpractice one day. AI, however, does not have judgment, creativity and most importantly empathy. It does not equate with emotional intelligence. AI is a tool and those in the legal profession, including lawyers and judges need to know how

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[352] *See* THE AI BUSINESS, *supra* note 215, at 262.

> to utilize it. Lawyers and judges are only as good as the information they receive, and AI has the potential to significantly improve the quality of that information.[353]

In 2020, Georgetown University's Center for the Study of the Legal Profession and Thomson Reuters' Peer Monitor found a "widespread disaggregation of services as clients have increasingly opted to create virtual teams."[354] Also, "[t]he rapid growth of alternative legal service providers (ALSPs), such as the Big Four consulting firms and other non-law firm service providers, is also becoming a major disruptor of the traditional law firm model."[355] The Center also found that, "[w]hile the previous law firm-centric model where firms decide how services are priced and delivered has been 'remarkably resilient' and moderately successful in recent years, clients have now taken 'decisive control' of the market and are demanding improved efficiency, predictability and cost-effectiveness."[356]

[125]   The legal profession will undergo immense changes in the future, including a reduction in the need for expensive lawyer services. In 2014, a report by the Canadian Bar Association laid out the need for legal reform, emphasizing that the key to a viable, competitive, and relevant legal

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[353] *See* Christina Montgomery, Chief Privacy Officer, IBM, Keynote Address at the 93rd Ann. Nat'l Conf. of Bankr. Judges: Artificial Intelligence Issues Affecting the Legal Profession 1, 9 (2019), https://ncbjmeeting.org/2019/materials/Artificial% 20Intelligence.pdf [https://perma.cc/L3TR-5ZAR].

[354] *2020 Report on the State of the Legal Market*, GEO. L. (Jan. 6, 2020), https://www. law.georgetown.edu/news/fundamental-shifts-are-disrupting-the-legal-market-2020-report-on-the-state-of-the-legal-market-from-georgetown-law-and-thomson-reuters-legal-executive-institute/ [https://perma.cc/VN5Y-TQ5H] (quoting the 2020 Report on the State of the Legal Market).

[355] *Id.*

[356] *Id.*

profession is innovation.[357]

[126]   Can we afford to ignore the competitive nature of the market?[358] Offering insight into such a multifaceted question, attorney Jonathan Brathwaite writes: "In the US, young lawyers already don't get jobs. Because of IBM Watson, you can get legal advice (so far for more or less basic stuff) within seconds, with 90% accuracy compared with 70% accuracy when done by humans."[359] An article that appeared in the Law Technology Today of the ABA suggested that lawyers who use AI will

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[357] *See* CANADIAN BAR ASSOCIATION, FUTURES: TRANSFORMING THE DELIVERY OF LEGAL SERVICES IN CANADA (2014), http://www.cba.org/cbamedialibrary/cba_na/pdfs/cba%20legal%20futures%20pdfs/futures-final-eng.pdf [https://perma.cc/PEJ6-76GP]; *see also* GEO. L, 2016 REPORT ON THE STATE OF THE LEGAL MARKET. (Jan. 7, 2016), https://www.thomsonreuters.com/content/dam/openweb/documents/pdf/corporate/press-releases/2016_pm_gt_final-report.pdf [https://perma.cc/SR9V-J7R9] ("Demand for law firm services . . . was essentially flat in 2015. . . . [and] continues a pattern seen over the last six years. . . . [T]here has been an overall downward trend in the productivity of all categories of timekeepers except associate." The report attributes some of this stagnation to business clients' reduced spending—a 25.8 percent between 2004 and 2014 in inflation-adjusted dollars. With increasing competition in the legal market, law firms are under pressure to invest in innovation.).

[358] *"2019 Report on the State of the Legal Market" Calls for Rebuilding the Law Firm Model*, GEO. L. (Jan. 9, 2019), https://www.law.georgetown.edu/news/rebuilding-the-law-firm-model-2019-report-on-the-state-of-the-legal-market/ [https://perma.cc/4K59-U45P] ("Amidst rapidly changing market conditions, law firms should seize the opportunity to question long-standing assumptions and re-examine traditional business models that may not be suited for growing challenges such as competition from the likes of the Big Four and more-nimble alternative legal service providers (ALSPs). Such competition is leading to high levels of talent and client poaching by rival firms, and firms' responses may be increasingly counterproductive.").

[359] Jonathan Brathwaite, *An interesting talk by the MD of Daimler Benz*, LINKEDIN (May 10, 2017), https://www.linkedin.com/pulse/interesting-talk-md-daimler-benz-jonathan-brathwaite/ [https://perma.cc/AF3E-5W97].

replace those who do not.[360]

[127] We must also look well ahead into the future to when the technological advances will be so profound that it will be difficult to maintain any of our existing models of practicing law. And while predicting the future is no easy game, market competition and the demands of our clients for lower costs and quick and inexpensive resolution of disputes will drive the innovational targets.

5. Funding AI in the Legal Profession

[128] I evaluate and mentor startups through the MIT Enterprise Forum Chapters of Central East Europe and Greece. In taking on the task, I look for certain specific characteristics or qualities of the startups, which include their exit strategy, capital raised and future funding needs, competition, if any, individuals involved, timeframe for entry to the market, size of the market, etc. But, as Adler described in 1983, funding opportunities for AI platforms will follow the trends that focus on "solutions in major problem areas."[361]

[129] In looking at the predictive analytics suggested by MarketsandMarkets and other market research outfits, it is hard to find any noticeable enthusiasm by scientists, researchers, major academic institutions, or venture capitalists that support the development of AI

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[360] *See Artificial Intelligence Won't Replace Lawyers—It Will Free Them*, L. TECH. TODAY (Feb. 27, 2018), https://www.lawtechnologytoday.org/2018/02/artificial-intelligence-wont-replace-lawyers-it-will-free-them/ [https://perma.cc/Y28X-SYPY] ("Altman Weil's *2017 Law Firms in Transition Survey* depicts a legal market experiencing increased price competition, a lack of efficiency in service delivery, an influx of new competitors, and the inescapable force of technology innovation. Therefore, to stay relevant, traditional law firms and legal departments must understand the potential of AI and legal technology. Lawyers must embrace the unique, emerging value of AI and build a legal culture that reinforces the human value—lawyers exercising independent professional judgment, focusing on meaningful, complex, and mission-critical work for their clients.").

[361] *See* THE AI BUSINESS, *supra* note 215, at 259.

platforms geared to the practice of law. Thus, AI applications developed for our profession will be a byproduct of AI platforms made for more lucrative industries that have the potential for monetization.

6. Lawyer Participation

[130] AI platforms cannot succeed without implementation. As Kraft stated:

> Development must be user driven. If the users think that this system will help them to alleviate a problem or provide a better solution or be more cost-effective than the current methodology, they will use it. If they think it is being foisted off on them, they will not use it. Expert systems cannot be forced into place; they must be carefully woven into the fabric of an organization.[362]

In the context of arbitrations, large organizations, such as the American Arbitration Association ("AAA") will eventually be forced to incorporate an AI arbitrator platform as part of its suite of available services.[363] However, it is unclear how lawyers will behave, even if scientists produce a trustworthy AI platform. For both the organizations and the lawyers, the changes will be dictated by the competitive nature of the marketplace and the demands of clients. And these are powerful forces that will make all of us adopt and adapt. In a world economy that has come to a halt due to the COVID-19 pandemic, the prospects of clients opting out for inexpensive dispute resolution methods that may include AI platforms are becoming quite real. Even more powerful is the potential insolvency of many companies and the consequent cost-cutting measures that law firms will have to implement.

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[362] *Id.* at 48.

[363] *See generally AAA-ICDR Technology Services*, Am. Arb. Ass'n, https://www.adr.org/TechnologyServices/technology-dispute-capabilities [https://perma.cc/2J3D-LB6F].

7. The Year 2100 – The Remake of Hal9000

[131] I believe there is a clear path for AI platforms to operate in anthropomorphic ways. Minsky said that machines "will become smarter than people. I do not think there is anything wrong with people, but I believe that evolution creeps along and that there is no reason to think that just because we are here now, we are the end of human evolution either."[364]

[132] I can imagine a DABUS-like arbitrator that can know that it is thinking or creating inventions but also having a potentially powerful stream of consciousness that can logically evaluate factual and legal patterns in resolving disputes. I can see a future, trustworthy cybersapien version of Hal9000 (let's call it "Hal9000 Plus") made from morphing materials that adapt to environmental and circumstantial changes, packed with integrated 3D printed human brain cells that power the blazingly fast processing chips.

[133] On top of that, Hal9000 Plus will use Google's bionically-mutated algorithms to remove the bias, and then deploy the artificial olfactory sensors to "smell," track and map the mood, the mental state, or the intent of the parties, witnesses, "tecarbitors," or even the few remaining traditional lawyers.[365] And this type of AI dispute resolution mechanism could ultimately lead us to achieve swift and cost-effective results closer to notions of "perfect justice," provided we do not forget the opinions Roscoe Pound articulated over 100 years ago:

> [The law] must be judged by the results it achieves, not by
> the niceties of its internal structure; it must be valued by the

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[364] *See* THE AI BUSINESS, *supra* note 215, at 251.

[365] *See* David Nield, *Google Engineers 'Mutate' AI to Make It Evolve Systems Faster Than We Can Code Them*, SCI. ALERT (Apr. 17, 2020), https://www.sciencealert.com/coders-mutate-ai-systems-to-make-them-evolve-faster-than-we-can-program-them [https://perma.cc/W6ZF-86B6]; C. Fisher, *Google researchers taught an AI to recognize smells*, ENGADGET (Oct. 24, 2019), https://www.engadget.com/2019-10-24-google-researchers-train-ai-smells.html [https://perma.cc/9F8U-6L33].

extent to which it meets its end, not by the beauty of its logical processes or the strictness with which its rules proceed from the dogmas it takes for its foundation.[366]

V. CONCLUSION[367]

[134] In Part II, I focused on the considerable power of the business community of the 1920s and the resources it marshaled in advancing the proposals for arbitration through the legislatures of several States and the Federal Government.[368] At the same time, the congressional hearings leading to the enactment of the FAA were "all about business" sessions, with the legal community of the time, including the ABA, occupying the status of an observer.

[135] In Part III, I reviewed the sections of the FAA that may be utilized to challenge the use of AI platforms in arbitrations.[369] On its face, the FAA does not prohibit the use of artificially intelligent platforms serving as arbitrators; however, the freedom of the parties to contract will ultimately be the decisive factor in support of such use. More importantly, the business community will force some legislative amendments to the FAA if they believe that AI platforms will save them money, and if judicial hostility continues to inhibit that process. Whether the business community could "strongarm" Congress as it did in 1924 remains to be seen, but there is a lot

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[366] Roscoe Pound, *Mechanical Jurisprudence*, 8 COLUM. L. REV. 605, 605 (1908).

[367] *See* Winston Maxwell & Gauthier Vannieuwenhuyse, *Robots Replacing Arbitrators: Smart Contract Arbitration*, 18 ICC DISP. RESOL. BULL. 24 (2018); Frank Emmert, *A Critical Review of the Kleros "Dispute Revolution"* (Sept. 10, 2019), https://medium.com/@prepayway/a-critical-review-of-the-kleros-dispute-revolution-a5453c7b8f88 [https://perma.cc/CY3T-RPES] (reviewing critically AI and smart contracts).

[368] *See supra* Part II.

[369] *See supra* Part III.

of power with money.[370]

[136]   In Part IV, I covered some relevant historical themes behind AI for purposes of setting the current state of AI, and then I dealt with some extraordinary discoveries that are indicators of the technological transformation that is taking place.[371] In many ways, we face the same obstacles in predicting the successful development of AI technology as we did in 1984, including how we approach the commercialization of ideas or research projects. I also included some business fundamentals that pertain to AI, concluding that there is not a lot of expected investment in our profession. More importantly, even if the technology is readily available, reliable, and cost-effective, the legal community may be hostile to it and will not easily implement it. Which in turn, means that venture capitalists will not fund it unless they see a real return on their investment. The judiciary may also be hostile to these changes, as the resolution of disputes through AI arbitral platforms could be a precursor to the remake of Hal9000 but wearing a robe.

[137]   Finally, I have always been fascinated by inventions that have considerable "social impact," but I am also skeptical of virtual arbitrations conducted through powered-up circuits. I believe that we will eventually duplicate human intelligence but whether it will be commercially available in our profession is a different story altogether. Nonetheless, I see the scientific community racing unrestrainedly in the fast lane of innovation whereas lawyers drive with the foot firmly on the brake pedal looking in the rear-view mirror. The business leaders are operating in different zones, with varying monetization interests, while legislative efforts often stymie

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[370] *See* Kevin M. Lewis, *An Avalanche of Arbitration: Three Federal Arbitration Act Cases at the Supreme Court*, CONG. RSCH. SERV. (Jan. 15, 2019), https://crsreports. congress.gov/product/pdf/LSB/LSB10205/5 [https://perma.cc/GU5D-QLMR] (discussing several bills have been recently introduced in Congress "that would work changes both great and small in the FAA regime, for example, by carving out certain areas from the FAA's reach, or by changing the procedures that would apply in arbitration. With the Court taking an increasing interest in the FAA, the interests of legislators, businesses, and litigators in this area may likewise increase in the future").

[371] *See supra* Part IV.

innovation due to timing lags. For me, this is mismanagement of innovation and the reason I included lengthy commentary on inventions and technical parlance with business views and scientific perspectives. I believe they are an integral part of the discussion about the future development of AI in our profession. Doing anything short would contradict the principle we must espouse, which is an interdisciplinary approach to legal education and the practice of law.