Artificial Intelligence and Cracks in the Foundation of Intellectual Property

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Our implicit image of progress and the standards we use to calibrate human contribution to progress are quietly at risk from the onslaught of artificial intelligence (AI). AI has the potential to significantly shrink the pool of creative work that is protectable by intellectual property (IP) law and the range of information that is protectable, as well as shrinking the value proposition of IP regimes themselves.

As society faces this changing landscape, we must tread carefully to distinguish fears about AI from the task of defining the boundaries of intellectual property, whose theoretic concepts aren't designed to bear such weighty burdens. We also should be wary of our all-too-human instinct to insist on the primacy of our individual contributions to innovation. What we choose to protect must be bounded by the value of the contribution. As that value shifts, in light of what AI makes commonplace, so must our boundaries shift for what we consider extraordinary.

Adaptation does not require reimaging the field. Rather, paths forward can be understood through the Allegory of the Diamond, described in Part IV. Law can limit the supply of products subject to protection, casting the net only around the remarkable, thereby preserving value and facilitating a coordinated body for providing a "Good Housekeeping Seal of Approval." Together, these two paths would mitigate problems threatening intellectual property regimes.

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One can predict much wailing and gnashing of teeth as we step into this iteration of human-technological interaction. In response, one could borrow a concept from both existential philosophers and their arch opponents, theologians: a little humility in the enterprise is due.

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INTRODUCTION

The Constitution is not a very long document. Yet tucked in the folds between granting Congress the power to establish the post office[1] and the power to create the lower courts[2] lies the power "to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[3] The constitutional establishment of copyrights and patents in the United States would later be joined by the development of common law rights in what the modern world knows as trade secrets and its slightly odd cousin, trademarks.[4] Together, copyright, patent, trademark, and trade secret form the basic pillars that are commonly described as intellectual property.[5]

Across hundreds of years, the core concepts of what we protect and why we protect it have remained relatively stable. Through tectonic technological shifts—the industrial revolution, the digital revolution, and the creation of the Internet, smart phones, and social media—these core concepts have persisted. Artificial intelligence (AI), however, threatens to shake the very foundations of intellectual property law.

1. U.S. CONST. art. I, § 8, cl. 7.

2. *Id.* art. I, § 8, cl. 9.

3. *Id.* art. I, § 8, cl. 8.

4. *See infra* Subpart.II.C (discussing ways in which Trademark is different from the other three intellectual property regimes).

5. Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 TEX. L. REV. 1031, 1033 n.4 (2005) (tracing history of the term's modern use to the establishment of World Intellectual Property Organization); Justin Hughes, *Copyright and Incomplete Historiographies: Of Piracy, Propertization, and Thomas Jefferson*, 79 S. CAL. L. REV. 993, 1001 (2006).

Much legal scholarship on AI,[6] as well as commentary[7] and even the occasional lawsuit,[8] focuses on how the modern wave of generative AI systems

6. *See, e.g.*, Jessica L. Gillotte, *Copyright Infringement in AI-Generated Artwork*, 53 U.C. DAVIS L. REV. 2655, 2658–59 (2020) (discussing the increasingly popular use of AI to generate artwork and the accompanying copyright infringement issues); Eric Sunray, *Train in Vain: A Theoretical Assessment of Intermediate Copying and Fair Use in Machine AI Music Generator Training*, 13 AM. U. INTELL. PROP. BRIEF 1, 23 (2021) (arguing that "intermediate copying" of copyrighted works for the purposes of training an AI model should not be excused under the fair use doctrine and proposing a license-based solution to protect a personality-based theory of intellectual property rights); Van Lindberg, *Building and Using Generative Models Under US Copyright Law*, 18 RUTGERS BUS. L. REV. 1, 2–3 (2023) (analyzing the question of copyright infringement by the training of generative deep learning AI models and arguing that such use should be exempted under fair use); s*ee also* Zeynep Ülkü Kahveci, *Attribution Problem of Generative AI: A View from US Copyright Law*, 18 J. INTELL. PROP. L. & PRAC. 796, 796, 806–07 (2023) (analyzing copyright infringement through an attribution lens and finding that authors whose intellectual property rights have been infringed and wish to bring a claim for attribution under US law will face many legal hurdles); Katherine B. Forrest, *Copyright Law and Artificial Intelligence: Emerging Issues*, 65 J. COPYRIGHT SOC'Y U.S.A. 355, 369–70 (2018) ("A lack of ability to control reproduction and display leads to a lack of control over essential aspects of the bundle of rights conveyed by the copyright. There is ultimately at least a short-term economic issue of skewed incentives: a lack of ability to control reproduction or display could lead to lessened willingness to undertake the costs of creation. Reduced incentives to create lead to reduced innovation."); Matthew Sag, *The New Legal Landscape for Text Mining and Machine Learning*, 66 J. COPYRIGHT SOC'Y U.S.A. 291, 301 (2019) (The potential copyright infringement from text data mining, an integral part of ML, should be considered non-expressive use of expressive works and be permitted without authorization: "The world will not end if there was no way to reconcile copyright with text mining, but it would be a much poorer place."); Daryl Lim, *AI & IP: Innovation & Creativity in an Age of Accelerated Change*, 52 AKRON L. REV. 813, 853 (2018) ("That human creativity can thrive only by fending off machine competition overlooks capabilities that allowed humans to survive and flourish throughout history. . . . The U.S. would be foolish not to use all that fair use has to offer to its advantage and supercharge the growth of Al-generated works.").

7. *See, e.g.*, CHRISTOPHER T. ZIRPOLI, CONG. RSCH. SERV., LSB10922, GENERATIVE ARTIFICIAL INTELLIGENCE AND COPYRIGHT LAW 3 (2023) (discussing the potential for GenAI to infringe other people's intellectual property rights both through use of protected materials for training data and through generating outputs resembling protected works); Gil Appel, Juliana Neelbauer & David A. Schweidel, *Generative AI Has an Intellectual Property Problem*, HARV. BUS. REV. (Apr. 7, 2023), https://hbr.org/2023/04/generative-ai-has-an-intellectual-property-problem (arguing for more transparency and that companies should be required to obtain creator-consent before using their work to train AI models, rather than the current trend which is to require the creator opt-out of the unauthorized use of their work and proposing that creators use their protected works to build their own datasets to train models which could then be licensed for use); *Data Colonialism and Data Sets*, HARV. L. REV. BLOG (June 22, 2023), https://harvardlawreview.org/blog/2023/06/data-colonialism-and-data-sets ("The colonization of data to generate training sets resembles a familiar plot in our world. Pioneers have once again sailed into the horizons, hoarding wealth and disregarding potential claims to property that don't fit within the dominant legal system. However, with data, society has an opportunity to not make the same mistakes of the past. . . . Even if copyright law might offer a judicial remedy against nonconsensual use of data, statutory oversight will likely be needed in order to protect parties without the resources to pursue litigation."); s*ee also* Alex Baldwin, *AI Can't Be Patent Inventor, Top UK Court Rules*, LAW360 (Dec. 20, 2023, 10:05 AM GMT), https://www.law360.com/articles/1777845/ai-can-t-be-patent-inventor-top-uk-court-rules (reporting on the U.K. Supreme Court's ruling in *Thaler v. Comptroller-Gen. of Pats., Designs & Trade Marks*, [2023] UKSC 49, which held that an artificial intelligence model cannot be an inventor under U.K. patent law).

8. There have been several lawsuits challenging the legality of Artificial Intelligence models using protected materials as training data. *See, e.g.*, Complaint at 7, Andersen v. Stability AI Ltd., 700 F. Supp. 3d 853 (N.D. Cal. 2023) (No. 3:23-cv-00201) (alleging that Stability AI and others have used copyrighted images available online to train their image-generating artificial intelligence model that produced new images without proper attribution to the owners of those copyrighted images used for training); Complaint at 6–7, Tremblay v. OpenAI, Inc., No. 3:23-cv-03223 (N.D. Cal. June 28, 2023) (alleging in a class action lawsuit on behalf of a class of authors that OpenAI has unlawfully duplicated and ingested authors' copyrighted materials without due

may impinge on intellectual property rights granted to others. Primary among those concerns is that generative AI systems pull their training data from information on the internet, much of which may be protected by copyright.[9] Other legal scholarship focuses on whether creations designed or co-designed by AI systems should receive intellectual property protection.[10] A final set of

compensation to the authors); Complaint at 13, Thomson Reuters Enter. Ctr. GmbH v. ROSS Intel. Inc., 529 F. Supp. 3d 303 (D. Del. 2020) (No. 1:20-cv-00613) (alleging that ROSS Intelligence, without permission, used the legal database of Westlaw, owned by the plaintiff Thomson Reuters, to train its own AI-powered legal research software); Complaint at 3, Getty Images (US), Inc. v. Stability AI, Inc., No. 1:23-cv-00135 (D. Del. Feb. 3, 2023) (alleging that Stability AI unlawfully used Getty Images' copyrighted material in order to train its image-generating model, Stable Diffusion, and that Stable Diffusion generates infringing derivative works as product output); Complaint at 12, Silverman v. OpenAI, Inc., No. 3:23-cv-03416 (N.D. Cal. July 7, 2023) ("Because the output of the OpenAI Language Models is based on expressive information extracted from Plaintiffs' works (and others), every output of the OpenAI Language Models is an infringing derivative work, made without Plaintiffs' permission and in violation of their exclusive rights under the Copyright Act."); Complaint at 7, J.L. v. Alphabet Inc., No. 3:23-cv-03440 (N.D. Cal. July 11, 2023) (alleging that Google's AI products relied on training data collected from the internet, including copyrighted texts, images, music, and other data).

9. *See, e.g.*, Mark A. Lemley & Bryan Casey, *Fair Learning*, 99 TEX. L. REV. 743, 748 (2021) ("ML systems should generally be able to use databases for training, whether or not the contents of that database are copyrighted."); Simon Chesterman, *Good Models Borrow, Great Models Steal: Intellectual Property Rights and Generative AI* 7 (NAT'L UNIV. OF SING. L., Working Paper No. 2023/025, 2023) (arguing that while models should be trained, they should not be trained on "stolen" data, and that compensation should be paid to the original human creators whose work is used to train the models); Giorgio Franceschelli & Mirco Musolesi, *Copyright in Generative Deep Learning*, 4 DATA & POL'Y E17-1, E17-4 (2022) (concluding that the fair use doctrine does potentially allow for storage of protected works for the purpose of training GenAI models but citing concerns over extending the doctrine to generative deep learning due to its overtly expressive nature); Nicola Lucchi, *ChatGPT: A Case Study on Copyright Challenges for Generative Artificial Intelligence Systems*, EUR. J. RISK REGUL., Aug. 29, 2023, at 1, 22 (discussing concerns over lawful collection of and use of copyrighted materials and arguing that training datasets should be considered shared resources available to all due to its need for collective participation); Benjamin L. W. Sobel, *Artificial Intelligence's Fair Use Crisis*, 41 COLUM. J.L. & ARTS 45, 74–75 (2017) ("Believing that machines differ fundamentally from human authors could imply that expressive machine learning always transforms the meaning of the works it appropriates. In a sense, this is true. The 'meaning' of a work does depend on its author and its reader. . . . In practice, however, the law disregards the idea, because it threatens to turn the doctrine to unenforceable mush. Every quotation reshapes meaning, but this does not turn every act of copying into transformative fair use; copying undertaken by artificial intelligence should be regarded with no less skepticism." (footnotes omitted)); *see also* Juha Vesala & Rosa M. Ballardini, *AI and IPR Infringement: A Case Study on Training and Using Neural Networks*, *in* REGULATING INDUSTRIAL INTERNET THROUGH IPR, DATA PROTECTION AND COMPETITION LAW 99, 99–101 (Rosa. M. Ballardini, Petri Kuoppamäki & Olli Pitkänen eds., 2019) (arguing that training neural network based AI models could in certain circumstances constitute infringement of patents and trade secrets under EU law but recognizing evidential difficulties in proving such infringement exist); David S. Levine, *Generative Artificial Intelligence and Trade Secrecy*, 3 J. FREE SPEECH L. 559, 580–83 (2023) (discussing the risk of accidental/inadvertent disclosures of trade secrets when using generative AI systems like Chat GPT: "the 'leakiness' (as Samuelson labels it) of trade secrecy arises from the law's unwillingness to protect trade secret holders from the misfortune of disclosure deemed accidental on their part and not 'improper,'" noting that "[t]his comports with both trade secrecy's underlying policies as well as the First Amendment's" and that "ChatGPT amplifies the leakiness challenge").

10. *See, e.g.*, Ryan Abbott & Elizabeth Rothman, *Disrupting Creativity: Copyright Law in the Age of Generative Artificial Intelligence*, 75 FLA. L. REV. 1141, 1201 (2023) (arguing that AI generated works should be protected and AI-owners be regarded as the rights-owners—"Encouraging the creation and dissemination of such content is the main purpose of the copyright system, and allowing copyright protection for AI-generated works will achieve this purpose. Once the desirability of protecting these works is acknowledged,

legal scholarship on AI considers safety and ethical concerns, often calling for—or conceptualizing methods of—regulating AI.[11] Despite this scholarly focus,

acknowledging AI authorship then becomes nothing more than opting for reality instead of elaborate legal fictions."); Shlomit Yanisky Ravid & Xiaoqiong (Jackie) Liu, *When Artificial Intelligence Systems Produce Inventions: An Alternative Model for Patent Law at the 3A Era*, 39 CARDOZO L. REV. 2215, 2252–55 (2018) (arguing against patent protection for AI inventions and proposing society and the market to protect and reward AI innovation through, for example, allowing first-movers to reap the benefits of a *de facto* monopoly, proper attribution to those involved in creating the AI system, and use of digital counterfeiting tools). *See also* Cole G. Merritt, *A Compulsory Solution to the Machine Problem: Recognizing Artificial Intelligence as Inventors in Patent Law*, 25 VAND. J. ENT. & TECH. L. 211, 223 (2023) (arguing that AI inventions should be protected by the grant of patents, since "the lack of any possibility for the grant of a patent for an AI-created invention will force more actors to pursue trade secrecy for inventions that would otherwise be patented, depriving the world of the disclosure that accompanies a patent application"); Faye F. Wang, *Copyright Protection for AI-Generated Works: Solutions to Further Challenges from Generative AI*, 5 AMICUS CURIAE 88, 97 (2023) (reviewing the status of AI-generated works in the U.K. and proposing the adoption of a collective licensing system where AI developers are represented by an intermediary who facilitates users in obtaining permissions for the use of AI-generated materials which otherwise would "involve a wider range of authors and rightsholders all over the world"); Lim, *supra* note 6, at 853 (discussing different approaches to protecting AI generated work under copyright and patent laws); Gregory Hagen, *AI and Patents and Trade Secrets*, *in* ARTIFICIAL INTELLIGENCE AND THE LAW IN CANADA 1, 5 (Florian Martin-Bariteau & Teresa Scassa eds., 2021) (exploring the extent to which intelligent agents, i.e. AI, could be considered inventors under patent law and expressing concern over the obsolescence of inventive disclosure in circumstances where intelligent agents are eventually able to invent independent of humans and unmotivated by grant of patents); Ben Hattenbach & Gavin Snyder, *Rethinking the Mental Steps Doctrine and Other Barriers to Patentability of Artificial Intelligence*, 19 COLUM. SCI. & TECH. L. REV. 313, 327 (2018) (discussing the test for patentable subject matter as set out in *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208 (2014), and arguing that claims utilizing the mental steps doctrine "if applied broadly in the artificial intelligence context, would make patenting in the area quite difficult"). For a discussion of protecting an AI system itself, see Katarina Foss-Solbrekk, *Three Routes to Protecting AI Systems and their Algorithms Under IP Law: The Good, the Bad, and the Ugly*, 16 J. INTELL. PROP. & PRAC. 247, 258 (2021) (finding that AI models lack proper protection under EU law resulting in companies using trade secrecy laws and arguing that patents and copyright law should protect AI models: "AI systems are clearly IP, and should be protected as such. They should not fall under the auspices of trade secrecy laws which are clearly not designed to protect AI, or any type of property or IP. Nor are trade secrets considered intellectual property by most EU Member States and, as above, AI systems are IP. Failing to recognize this is counterproductive for both business and societal interests.").

11. *See* Martin Senftleben, *Generative AI and Author Remuneration*, 54 INT'L REV. INTELL. PROP. & COMPETITION L. 1535, 1549 (2023) (proposing an AI system levy for author remuneration under which "providers of generative AI systems would be obliged to pay remuneration for producing literary and artistic content *that* has the potential to replace human creations" (emphasis added)). For a broad discussion on AI ethical concerns, see, for example, Christina Pazzanese, *Ethical Concerns Mount as AI Takes Bigger Decision-Making Role in More Industries*, HARV. GAZETTE (Oct. 26, 2020), https://news.harvard.edu/gazette/story/2020/10/ethical-concerns-mount-as-ai-takes-bigger-decision-making-role (discussing three areas of ethical concern for AI use: privacy and surveillance, discrimination, and the role of human judgment); BRENT MITTELSTADT, COUNS. EUR. STEERING COMM. HUM. RTS. IN THE FIELDS OF BIOMEDICINE AND HEALTH, THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE DOCTOR-PATIENT RELATIONSHIP 56 (2022) (discussing the variety of ethical risks arising from the use of AI in doctor-patient relationships and recommending that AI systems be required to (1) include contrastive explanation statements intelligible to patients, (2) be registered with a public body and (3) be bias tested). For insight into how industry is considering AI ethics, see DELOITTE, STATE OF ETHICS AND TRUST IN TECHNOLOGY: ANNUAL REPORT 3, 13 (2d ed. 2023) (surveying a population of 1,716 "business and technical professionals who are actively involved in either developing, consuming, or managing emerging technologies" and found, *inter alia,* that 74% of survey respondents had begun testing generative AI technologies and that data privacy and transparency were primary ethical concerns with AI use). For discussion of the E.U.'s approach to AI regulation, see, for example, Ulla-Maija Mylly, *Transparent AI? Navigating Between Rules on Trade Secrets and Access to Information*, 54 INT'L

one issue remains largely unexamined: as AI reaches its tendrils throughout society, it threatens to undermine the foundations of what we aim to protect with intellectual property in the first place and how it derives its value.

In particular, our implicit image of progress, and the standards we use to calibrate the value of human contributions to that progress, are quietly at risk from the onslaught of AI. AI has the potential to significantly shrink the pool of creative works that are protected by IP and information that is protected by IP, particularly shrinking the protectable space for the work of human contributors. Moreover, AI has the potential to shrink the value proposition of the intellectual property regimes, themselves.

The changes wrought by AI create existential questions for society's conception of human invention. The term "existential" is used here not in the modern lingo of threatening something's existence, but rather in the broad sense of philosophical existentialism, as being concerned with exploring the meaning and value of human existence.[12] In this case, the concerns are the purpose of intellectual property and its implications for the value of human invention.

As we face this changing landscape, we cannot behave as the proverbial saboteurs, throwing our "sabots" into the machinery in hopes of stopping its gears from grinding.[13] The march of technology rarely retreats. We also must tread carefully to distinguish our fears about AI taking over the world[14] from the task of defining the boundaries of intellectual property. Intellectual property's theoretical concepts aren't designed to bear such weighty burdens, and the doctrines have largely avoided taking on the weighty mantle of morality in the United States outside the realm of commercial morality.[15] Regulation of

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REV. INTELL. PROP. & COMPETITION L. 1013, 1015 (2023) (discussing disclosure obligations under the EU's Artificial Intelligence Act imposed upon AI providers as a method of ensuring EU citizen oversight and analyzing how those obligations interfere with trade secret protections to the extent that they are protected).

12. Kevin Aho, *Existentialism*, *in* THE STANFORD ENCYCLOPEDIA OF PHIL. (Edward N. Zalta & Uri Nodelman eds., 2023), https://plato.stanford.edu/archives/sum2023/entries/existentialism; JENNIFER A. GOSETTI-FERENCEI, ON BEING AND BECOMING: AN EXISTENTIALIST APPROACH TO LIFE 37–55 (2021); Jon Stewart, *Existentialism*, *in* ENCYCLOPEDIA OF APPLIED ETHICS 250–63 (Ruth Chadwick ed., 2d ed. 2012).

13. Douglas Harper, *Sabotage*, ONLINE ETYMOLOGY DICTIONARY, https://www.etymonline.com/word/sabotage (last visited Dec. 15, 2024).

14. Such images arise both in the fictional world and in current commentary. *See, e.g.*, Joshua Rothman, *Why the Godfather of A.I. Fears What He's Built*, NEW YORKER (Nov. 13, 2023), https://www.newyorker.com/magazine/2023/11/20/geoffrey-hinton-profile-ai (introducing Geoffrey Hinton, known as the "godfather of AI," who recently left his job at Google and was worried about the "existential threat" posed by AI technology); DANIEL H. WILSON, ROBOPOCALYPSE (2011) (writing of a fictional artificial intelligence technology which becomes humanity's deadly enemy); Kevin Roose, *Silicon Valley Confronts a Grim New A.I. Metric*, N.Y. TIMES (Dec. 6, 2023), https://www.nytimes.com/2023/12/06/business/dealbook/silicon-valley-artificial-intelligence.html (explaining "P(doom)," short for "probability of doom," which measures the likelihood that "A.I. will kill us all, or create some other cataclysm that threatens human survival. A high p(doom) means you think an A.I. apocalypse is likely, while a low one means you think we'll probably tough it out.").

15. *See infra* Part.II.

technology—whether it is labor laws to protect industrial revolution workers,[16] criminal codes outlawing possession of burglar's tools,[17] or regulation of federal funding for germline gene-editing research on humans[18]—can attempt to address society's broader moral and ethical concerns.

In the same vein, we should be wary of our all-too-human instinct to insist on the primacy of our own, individual contributions to innovation. The measure of human contribution to intellectual property in no way reflects the measure of ourselves as human beings. Nor will acknowledging the changes brought by technological advancement diminish us as human beings. After all, technological advancement is a *product* of human innovation—not a replacement or substitute for it.

Perhaps in that context, we might do well to remember the quote from Robert South, that, "if there be any truer measure of a man than by what he does, it must be by what he gives."[19] In keeping with that ideal, what we choose to protect must be bounded by the value of the human contribution represented. And as that value shifts, in light of what AI makes commonplace, so must our boundaries shift for that which we consider extraordinary.

Change is not necessarily bad. Intellectual property itself has expanded dramatically, seeping into every aspect of modern existence. This expansion, pushing at the seams of the doctrines, has drawn its fair share of criticism.[20] In

16. Fair Labor Standards Act, 29 U.S.C. §§ 201–219 ("FLSA"). Passed in 1938, FLSA provides a national minimum hourly wage (§ 206), mandatory overtime compensation (§ 207), restricting employment of minors (§ 212), etc.

17. CAL. PENAL CODE § 466 (West 2012) (amended 2018) (California statue for possession of burglarious tools); N.Y. PENAL LAW § 140.35 (McKinney 2014) (New York statue for possession of burglarious tools).

18. Balanced Budget Downpayment Act, I, Pub L. No. 104-99, § 128, 110 Stat. 26 (1996) (denying federal funding for germline gene-editing research on human embryos); *see also* Francis S. Collins, *Statement of NIH Funding of Research Using Gene-editing Technologies in Human Embryos*, NIH (Apr. 28, 2015), https://www.nih.gov/about-nih/who-we-are/nih-director/statements/statement-nih-funding-research-using-gene-editing-technologies-human-embryos ("NIH will not fund any use of gene editing technologies in human embryos.").

19. 1 ROBERT SOUTH, TWELVE SERMONS PREACHED UPON SEVERAL OCCASIONS 331 (Philadelphia, John Ball, new ed. 1850).

20. A common doctrinal expansion has been the "propertization" of intellectual property, which has drawn criticism for both its broad scope and its absolute nature of protection. *See, e.g.*, Michael A. Carrier, *Cabining Intellectual Property Through a Property Paradigm*, 54 DUKE L.J. 1, 12 (2004) ("In short, IP is quickly becoming property not only in the essentially unlimited scope and duration of its initial rights but also in the ubiquitous assertions that IP is absolute property."); Lemley, *supra* note 5, at 1032 (arguing that intellectual property's goal of eliminating "free riding" is ill-suited); Andrew Beckerman-Rodau, *The Problem with Intellectual Property Rights: Subject Matter Expansion*, 13 YALE J.L. & TECH. 35, 88 (2010) (positing the expansion of eligible subject matter has led to overprotection, in the form of overlapping protections from multiple bodies of intellectual property law); Robin C. Feldman, *Intellectual Property Wrongs*, 18 STAN. J.L., BUS. & FIN. 250, 253–59 (2013) (describing magnification and questionable use of intellectual property rights, such as for engaging in anti-competitive schemes); NEIL W. NETANEL, COPYRIGHT'S PARADOX 4–12 (2008) (detailing the troublesome areas of copyright's expansion, including copyright duration, new media, etc.); LAWRENCE LESSIG, REMIX: MAKING ART AND COMMERCE THRIVE IN THE HYBRID ECONOMY 18 (2008) ("The extreme of regulation that copyright law has become makes it difficult, and sometimes impossible, for a wide range of creativity that any free society . . . would allow to exist, legally."); Chad J. Doellinger, *A New*

that context, AI may operate as a counterbalance, limiting protection to works truly worthy of protection. AI may also provide academics and policy makers with an opportunity to plumb the depths of why we have intellectual property protection for human invention in the first place, examining that theoretic grounding in the context of modern innovation.

Fortunately, adapting to the changes on the horizon for intellectual property does not require a wholesale reimagining of the field. Rather, paths forward can be understood through the Allegory of the Diamond, which illustrates the close relationship between value and scarcity. With that image as the backdrop, the legal system can limit the supply of products subject to protection, casting the net only around the remarkable and thereby preserving market value. The legal system can also facilitate a coordinated certification body to provide what would amount to a "Good Housekeeping Seal of Approval" to reinforce the value proposition of intellectual property itself.[21] Together, these approaches would mitigate problems threatening the four intellectual property regimes.

As we step into this next iteration of human-technological interaction, with its implications for the future of intellectual property, one can predict much weeping and gnashing of teeth.[22] In response, one could loosely borrow a concept from both existential philosophers and their arch opponents,

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Theory of Trademarks, 111 DICK. L. REV. 823, 827–29 (2007) (critiquing the modern "economic perspective" of trademark law for: forgetting its normative history in integrity, misclassifying trademarks as property, and forgetting its supra-economic concerns); Mark P. McKenna, *A Consumer Decision-Making Theory of Trademark Law*, 98 VA. L REV. 67, 78–79 (2012) (summarizing critiques of consumer search costs, including: reverse confusion, initial interest confusion, post-sale confusion, dilution, amongst others); Robin Feldman & Charles T. Graves, *Naked Price and Pharmaceutical Trade Secret Overreach*, 22 YALE J.L. & TECH. 61, 79–84 (2020) (explaining how increased trade secrecy claims, made outside of their commonplace civil litigation context, generate risks to the public interest); Charles T. Graves & Sonia K. Katyal, *From Trade Secrecy to Seclusion*, 109 GEO. L.J. 1337, 1342, 1403 (2021) (arguing that trade secret law has expanded beyond traditional use as a tool against intellectual property misappropriation, to a tool for concealment). In patent law, some scholars criticize its expansion stemming from the creation of the Federal Circuit Court of Appeals. *E.g.*, Ian Ayres & Paul Klemperer, *Limiting Patentees' Market Power Without Reducing Innovation Incentives: The Perverse Benefits of Uncertainty and Non-Injunctive Remedies*, 97 MICH. L. REV. 985, 986–89 (1999). Critics also take issue with what they deem ineligible subject matter, such as organic material, computer software, financial services and business methods. *E.g.*, Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698, 698 (1998) (gene fragments and other biological materials); James Gleick, *Patently Absurd*, N.Y. TIMES MAG. (Mar. 12, 2000), https://archive.nytimes.com/www.nytimes.com/library/magazine/home/20000312mag-patents.html (ecommerce); Seth Shulman, *Software Patents Tangle the Web*, MIT TECH. REV. (Mar. 1, 2000), https://www.technologyreview.com/2000/03/01/236373/software-patents-tangle-the-web/ (software patents). Some scholars believe existing eligible patent subject matter includes inventions that would have been generated otherwise, thereby producing a suboptimal amount of investment. *E.g.*, Ofer Tur-Sinai, *Beyond Incentives: Expanding the Theoretical Framework for Patent Law Analysis*, 45 AKRON L. REV. 243, 244–45 (2015).

21. *Choosing Products With the Good Housekeeping Seal Matters, Here's Why*, WINDOW WORLD (Feb. 1, 2021), https://www.windowworld.com/blog/what-is-the-good-housekeeping-seal-history-faqs-more.

22. *See Lamentations* 2:16 (King James) (demonstrating the use of the phrase "weeping and gnashing of teeth" with a different connotation).

theologians. Specifically, a little humility in the enterprise is due.[23] In a period of profound change, the ground beneath us will be unsettled for quite some time, and there is much we do not understand.

I. AN OVERVIEW OF ARTIFICIAL INTELLIGENCE

The following Subparts on AI provide a synopsis of the science and current uses of this technology. Those who are well-versed in the topic, or those who would prefer to avoid it altogether, may prefer reading the brief tour. For those who are interested in a more detailed discussion, Subpart I.B provides a deeper dive.

A. A BRIEF TOUR

Modern AI systems use statistical models called neural networks to accomplish various tasks.[24] As the name suggests, the name "neural networks" is borrowed from biology.[25] Notwithstanding that computer neural networks and biological neural networks are different in both structure and complexity, there are some striking similarities. Just as the human brain has biological mechanisms for storing what we learn, computer neural networks serve a similar function: they help AI systems update their understanding with each new piece of information. The more high-quality information a system gets—we call this information "training data"—the better the AI model becomes.[26] A sentient AI could make decisions and operate entirely on its own in the manner of human beings, as well as think about, feel, and perceive the world as humans do.[27] The potential for truly sentient AI, however, remains in the minds of science fiction writers. As Dan Burk noted, "computer science has given up on building machines that can think, in favor of building machines that can learn."[28]

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23. *Compare* the existentialists' concept of "absurdity," Douglas Burnham & George Papandreopoulos, *Existentialism*, INTERNET ENCYCLOPEDIA OF PHIL., https://iep.utm.edu/existent (last visited Dec. 15, 2024) ("Human beings can and should become profoundly aware of this lack of reason and the impossibility of an immanent understanding of it."), *and* ALBERT CAMUS, THE MYTH OF SISYPHUS (Justin O'Brien trans., Vintage Books 2d ed. 2018) (1942) (credited with introduction of this concept, termed "existentialist absurdism"), *with* theologians' conception of full knowledge belonging to a deity, and thus outside of human comprehension. *E.g.*, *Isaiah* 55:8–9 (New Living Translation) ("'My thoughts are nothing like your thoughts,' says the LORD. 'And my ways are far beyond anything you could imagine. For just as the heavens are higher than the earth, so my ways are higher than your ways and my thoughts higher than your thoughts.'").

24. IAN GOODFELLOW, YOSHUA BENGIO & AARON COURVILLE, DEEP LEARNING 2–8 (2016).

25. Robin Feldman, *Artificial Intelligence: The Importance of Trust & Distrust*, 21 GREEN BAG 201, 202 (2018).

26. *Id.* at 203.

27. *See infra* discussion in Subpart.I.B. *See generally* A.J. Alvero & Courtney Peña, *AI Sentience and Socioculture*, 4 J. SOC. COMPUTING 205, 206 (2023) (arguing LLMs are unlikely to become sentient because of their inability to develop social relationships); Marc M. Anderson, *How We Will Discover Sentience in AI*, 4 J. SOC. COMPUTING 181, 183–87 (2023) (discussing competing arguments regarding the potential sentience of artificial intelligence).

28. *See* Marion Fourcade & Kieran Healy, *Seeing Like a Market*, 15 SOCIO-ECON. REV. 9, 24 (2017) ("The new machines do not need to be able to think; they just need to be able to learn."); Dan L. Burk, *AI Patents and the Self-Assembling Machine*, 105 MINN. L. REV. HEADNOTES 301, 302 (2021) (citing Fourcade and Healy).

Of course, although AI models may be capable of impressive feats in "learning" the discrete tasks they're specifically trained on, there is much they still cannot do. Most feats in the physical realm are still beyond their capabilities. An AI will not be cooking you breakfast or making your bed any time soon.[29] For now, the most-advanced AI approaches are likely to remain systems that can augment human capacity, rather than systems that replace human beings and operate entirely on their own. As I have noted in the past, "[for] movie buffs, think [about] Iron Man, in which a weaponized suit enhances the protagonist's capacities, as opposed to the Terminator, in which a machine-like cyborg does everything by itself."[30] Today's AI systems may not give us the Iron Man suit yet, but they are certainly better than any garment hanging in the closet.

Advancements in AI have moved at an astonishing pace, analogous to what would be many lifetimes in other industries.[31] In fact, the technical basis for most modern AI products is Google's research paper introducing the transformer architecture, which emerged only seven years ago.[32] Then, in November of 2022, ChatGPT, the generative AI chatbot, exploded into the public's consciousness, becoming widely and freely available.[33] The release sparked interest in a cutting-edge form of AI, known broadly as "generative AI."[34]

The difference between using prior content technologies (including search engines) and using the newest generative AI systems is like the difference between carrying water buckets for a well and turning on the faucet in the

29. *But see* The Waymo Team, *Waymo Significantly Outperforms Comparable Human Benchmarks Over 7+ Million Miles of Rider-only Driving*, WAYPOINT (Dec. 20, 2023), https://waymo.com/blog/2023/12/waymo-significantly-outperforms-comparable-human-benchmarks-over-7-million (suggesting, in an autonomous car safety report, that Waymo's autonomous cars outperform human drivers).

30. *See* Feldman, *supra* note 25, at 204.

31. *Oversight of A.I.: Principles for Regulation Before the S. Comm. on the Judiciary*, 118th Cong. 2 (2023) (written testimony of Dario Amodei, Ph.D., Co-Founder and CEO, Anthropic) ("[S]imple underlying factors . . . compound with each other to produce a staggering rate of progress.").

32. Ashish Vaswani, Noam Shazeer, Niki Parmar, Jakob Uszkoreit, Llion Jones, Aiden N. Gomez, Lukasz Kaiser & Illia Polosukhin, *Attention Is All You Need*, *in* 30 ADVANCES IN NEURAL INFO. PROCESSING SYS. 1 (2017). This landmark paper introduced the artificial intelligence architecture known as "transformers," which has since been used to build almost every contemporary AI product. Such products include: ChatGPT, GPT-4, Github Copilot, Midjourney, amongst others. *See, e.g.*, OPENAI, GTP-4 TECHNICAL REPORT 2 (2023) ("GPT-4 is a Transformer-based model pre-trained to predict the next token in a document."). In fact, the "T" in OpenAI's GPT-4 stands for *Transformers*.

33. Bernard Marr, *A Short History of ChatGPT: How We Got to Where We Are Today*, FORBES (May 18, 2023, 1:14 AM EDT), https://www.forbes.com/sites/bernardmarr/2023/05/19/a-short-history-of-chatgpt-how-we-got-to-where-we-are-today (setting out the history of ChatGPT and describing the launch of GPT-3 as a "pivotal moment when the world started acknowledging this groundbreaking technology").

34. For definitions of generative AI, see Walter H. L. Pinaya et al., Generative AI for Medical Imaging: Extending the MONAI Framework 2 (July 27, 2023) (unpublished manuscript) (on file at https://arxiv.org/abs/2307.15208) ("Generative AI refers to a set of artificial intelligence techniques and models designed to learn the underlying patterns and structure of a dataset and generate new data points that plausibly could be part of the original dataset."). *See also* U.S. GOV'T ACCOUNTABILITY OFF., GAO-23-106782, SCIENCE & TECH SPOTLIGHT: GENERATIVE A.I. 1 (2023) ("Generative artificial intelligence (AI) is a technology that can create content, including text, images, audio, or video, when prompted by a user. Generative AI systems create responses using algorithms that are trained often on open-source information, such as text and images from the internet.").

kitchen. It blissfully reduces the amount of manual labor involved. But the question remains: is the water as pure and as sweet?

B. A DEEPER DIVE

At the outset, it is important to clarify exactly what one means by "artificial intelligence." Since John McCarthy's 1955 coinage[35] of the term, varying definitions,[36] technological changes, and growing media attention have led to misleading assumptions[37] and anthropomorphisms[38] of these systems. Any discussion, therefore, requires definition and demystification. A commonly used definition of AI refers to the use of computing systems for automating tasks that would normally require human intelligence.[39] Key federal agencies further define AI as software or hardware that can "learn to solve complex problems,

35. *See* JOHN MCCARTHY, WHAT IS ARTIFICIAL INTELLIGENCE? 2–3 (2007), http://www-formal.stanford.edu/jmc/whatisai.pdf.

36. *See, e.g.*, Matthew U. Scherer, *Regulating Artificial Intelligent Systems: Risks, Challenges, Competences, and Strategies*, 29 HARV. J.L. & TECH. 353, 360 (2016) (arguing no widely accepted definition of AI exists, as definitions of human functions, like "intelligence," are difficult to classify); STUART J. RUSSELL & PETER NORVIG, ARTIFICIAL INTELLIGENCE: A MODERN APPROACH 2–14 (3d ed., Pearson Educ. 2010) (including definitions such as thinking rationally and acting humanly); MARCUS HUTTER, UNIVERSAL ARTIFICIAL INTELLIGENCE: SEQUENTIAL DECISIONS BASED ON ALGORITHMIC PROBABILITY 125–26, 231 (Wilfried Brauer, Grzegorz Rozenberg & Arto Salomaa eds., 2010) (positing that AI are intelligent as they possess certain skills such as classification, language processing, and optimization, amongst others); Joshua A. Goland, *Algorithmic Disgorgement: Destruction of Artificial Intelligence Models as the FTC's Newest Enforcement Tool for Bad Data*, 29 RICH. J.L. & TECH. 1, 5 (2023).

37. Daria Kim, Maximilian Alber, Man Wai Kwok, Jelena Mitrović, Cristian Ramirez-Atencia, Jesús R. Perez & Heiner Zille, *Ten Assumptions About Artificial Intelligence That Can Mislead Patent Law Analysis* (Max Planck Inst. for Innovation & Competition, Working Paper No. 21-18, 2021) (unpublished research paper, on file with author).

38. *See* Alicia Solow-Niederman, *Administering Artificial Intelligence*, 93 S. CAL. L. REV. 633, 635 (2020) (describing the urge to anthropomorphize AI as autonomous actors). *See also* Catalina Goanta, Gijs van Dijck & Gerasimos Spanakis, *Back to the Future: Waves of Legal Scholarship on Artificial Intelligence*, *in* TIME, LAW, AND CHANGE 327, 328 (Sofia Ranchordás & Yaniv Roznai eds., 2020) (describing artificial intelligence has having "cognitive functions that are inherently human"); Dan Robitzski, *You Have No Idea What Artificial Intelligence Really Does*, FUTURISM (Oct. 16, 2018, 11:25 AM EDT), https://futurism.com/artificial-intelligence-hype ("'People think AI is a smart robot that can do things a very smart person would—a robot that knows everything and can answer any question[]' . . . . But this is not what experts really mean when they talk about AI. 'In general, AI refers to computer programs that can complete various analyses and use some predefined criteria to make decisions.'") (quoting Emad Mousavi).

39. *See, e.g.*, Harry Surden, *Artificial Intelligence and Law: An Overview*, 35 GA. ST. U. L. REV. 1305, 1307 (2019) (describing AI as automating tasks that usually require human intelligence); Clark D. Asay, *Artificial Stupidity*, 61 WM. & MARY L. REV. 1187, 1190 (2020) (defining AI as computing systems that perform tasks that would normally require human intelligence); Scherer, *supra* note 36, at 362 (acknowledging the difficulty of defining AI and adopting the definition of AI as machines capable of performing tasks that usually require human intelligence); *What Is AI?: Learn About Artificial Intelligence*, ORACLE (May 31, 2021), https://www.oracle.com/artificial-intelligence/what-is-ai ("AI has become a catchall term for applications that perform complex tasks that once required human input[] . . . ."); Tiffany C. Li, *Algorithmic Destruction*, 75 SMU L. REV. 479, 484 (2022) ("Al refers to any form of intelligence that is man-made or artificial, generally relating to the idea of a constructed machine intelligence that could potentially equal the intelligence of a human being."); *see also Artificial Intelligence*, OXFORD ENG. DICTIONARY, https://www.oed.com/view/Entry/271625 (last visited Dec. 15, 2024) ("[S]oftware used to perform tasks or produce output previously thought to require human intelligence[] . . . .").

make predictions or undertake tasks that require human-like sensing (such as vision, speech, and touch), perception . . . planning, learning, communication, or physical action."[40]

The primary strategy for modern AI development involves the application of "learning" algorithms.[41] Located within the field of computer science known as "machine learning," these algorithms learn through iterative experience in certain tasks, enhancing their performance in those tasks over time.[42] This learning is not identical to the process of human learning. Rather than building a theoretical understanding of the task it has been set to achieve, machine learning systems identify statistical correlations and patterns in the "training data" to continuously tweak their outputs, with the goal of making those outputs more accurate.[43]

Consider spam e-mail detection. A developer trains a machine-learning system on a vast collection of e-mail messages to produce results comparable to, or better than, humans at detecting which e-mails are likely to be spam. The AI, however, is not comprehending the emails as a person might. Rather, the AI uses the statistical correlations it has generated between words and other features from the emails it has reviewed to guide its classification (spam/not-spam) of a new, unseen e-mail.

The subfield of machine learning known as "deep learning" has achieved particular success in recent years. Inspired by (but certainly not replicating) the biological networks of the human brain, deep learning uses computational models known as "artificial neural networks" to learn complex data relationships. The term "deep" refers to the repeated and layered iterations in which the training data is processed, allowing the system to learn hierarchal representations of data. Each layer in the network extracts different features from the input data, and subsequent layers build upon those extracted features, thereby learning more intricate and sophisticated patterns in the data.

At the cutting edge of this technology, many of today's most sophisticated, and certainly most popular, deep learning models are known as "generative

40. OFF. OF THE CHIEF ECONOMIST AT THE U.S. PAT. & TRADEMARK OFF., INVENTING AI: TRACING THE DIFFUSION OF ARTIFICIAL INTELLIGENCE WITH U.S. PATENTS 3 (2020), https://www.uspto.gov/sites/default/files/documents/OCE-DH-AI.pdf [hereinafter INVENTING AI] (citing the National Institute of Standards and Technology's definition of AI). The USPTO provides eight categories for AI, including: AI hardware, planning/control, knowledge processing, speech, vision, machine learning, natural language processing, and evolutionary computation. *Id.*

41. *See* Burk, *supra* note 28, at 303 ("Fourcade and Healy have observed, computer science has given up on building machines that can think in favor of building machines that can learn."); Fourcade & Healy, *supra* note 28, at 24 ("The new machines do not need to be able to think; they just need to be able to learn.").

42. *See* Ryszard S. Michalski, Jamie G. Carbonell & Tom M. Mitchell, *An Overview of Machine Learning*, *in* MACHINE LEARNING: AN ARTIFICIAL INTELLIGENCE APPROACH 3, 3–6 (Ryszard S. Michalski, Jaime G. Carbonell & Tom M. Mitchell eds., 1983) [hereinafter MACHINE LEARNING].

43. *See* David Lehr & Paul Ohm, *Playing with the Data: What Legal Scholars Should Learn About Machine Learning*, 51 U.C. DAVIS L. REV. 653, 670–71 (2017); IAN H. WITTEN, EIBE FRANK & MARK A. HALL, DATA MINING: PRACTICAL MACHINE LEARNING TOOLS AND TECHNIQUES 7–8 (3d ed. 2011).

artificial intelligence" systems.[44] These models are intended to create content, such as text, images, code, audio, or video when prompted by a user.[45] Among the increasing number of commercial generative AI products, perhaps none is as well-known as ChatGPT.[46] A chatbot that relies on a deep learning model trained on natural language data, ChatGPT is able to generate human-like text responses based on text inputs provided by its users. In the eyes of many commentators, ChatGPT's public release and global popularity have served as a symbol of the start of a new AI boom.[47]

The enormous progress in generative AI has been fueled by increases in computational capacity[48] and the volume of accessible training data. In other words, we have more data and a greater ability to process that data. As Richard Sutton explained in his commentary, *The Bitter Lesson*, the major breakthroughs in AI, including the breakthroughs that would lead to generative AI systems, can be traced to leaps in computing power and the amount of data available, rather than the brilliance of the human scientific mind.[49]

The difference in the amount of computer power that modern AI systems train on is enormous. In addition, a high degree of quality, representativeness, and volume of data enhances the model's proficiency.[50] Thus, the explosion of collected and digitized data, known as "Big Data," has fueled the rapid expansion of AI systems and their uses. These massive leaps in computing power and data collection, along with advances in algorithmic quality, have produced staggering rates of progress in the field of AI. Deep learning models were not even practical until 2006, when a paper introduced a method for quickly

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44. *See* Kim Martineau*, What Is Generative AI?,* IBM RSCH. BLOG (Apr. 20, 2023), https://research.ibm.com/blog/what-is-generative-AI; *see generally* Pinaya et al., *supra* note 34.

45. *See supra* note 34 and accompanying text.

46. Jon Porter, *ChatGPT Continues to Be One of the Fastest Growing Services Ever*, VERGE (Nov. 6, 2023, 10:03 AM PST), https://www.theverge.com/2023/11/6/23948386/chatgpt-active-user-count-openai-developer-conference ("ChatGPT was widely seen as the fastest-growing consumer internet app of all time . . . notching an estimated 100 million monthly users in just two months. Facebook, for example, took around four and a half years to hit 100 million users after its launch in 2004[] . . . .").

47. *See* Gerrit De Vynck, *ChatGPT Loses Users for the First Time Shaking Faith in AI Revolution*, WASH. POST (July 7, 2023, 6:00 AM), https://www.washingtonpost.com/technology/2023/07/07/chatgpt-users-decline-future-ai-openai (providing examples of large investments and popularity growth); Kevin Roose, *A Coming-Out Party for Generative A.I., Silicon Valley's New Craze*, N.Y. TIMES (Oct. 21, 2022), https://www.nytimes.com/2022/10/21/technology/generative-ai.html (identifying the next A.I. boom); Kevin Roose, *How ChatGPT Kicked Off an A.I. Arms Race*, N.Y. Times (Feb. 3, 2023), https://www.nytimes.com/2023/02/03/technology/chatgpt-openai-artificial-intelligence.html?smid=url-share (calling ChatGPT the start of an "arms race").

48. Neil C. Thompson, Shuning Ge & Gabriel F. Manso, The Importance of (Exponentially More) Computing Power 2 (June 28, 2022) (unpublished manuscript) (on file at https://arxiv.org/abs/2206.14007) ("Across . . . different domains, we find that computing power is an important part of the production function.").

49. *See* Rich Sutton, *The Bitter Lesson*, RICHARD S. SUTTON, FRS FRSC (Mar. 13, 2019), http://www.incompleteideas.net/IncIdeas/BitterLesson.html. Sutton wrote the essay three years prior to the release of Chat GPT, using the term "natural language processing," rather than the more general term used in this article, "generative AI."

50. MACHINE LEARNING, *supra* note 42, at 3–24.

training neural networks.[51] The basis for most modern neural networks, called generative adversarial models, emerged eight years later, in 2014.[52] Only as recently as 2017 did the transformer architecture, a foundational building block for a wide range of current state-of-the-art language processing models, emerge in a way that propelled AI technology forward.[53]

The advancements in AI systems' capabilities have produced widespread adoption in society, as well as immeasurable impact. Indeed, these systems are drastically changing how schools teach,[54] judges sentence prisoners,[55] creatives generate art,[56] medical patients receive care,[57] and financial systems operate.[58] Across industry sectors, from electronics to biotechnologies, innovation itself receives support from machine learning systems.[59] Even the U.S. Patent Office noted, "AI has the potential to fundamentally change how people perceive the world around them and live their daily lives."[60]

Despite such proliferation, tensions still exist with AI adoption. In what is often called the "black box" problem,[61] the technical complexity associated with a system's sheer volume of calculations and data leads many of its processes to remain mysterious to observers. In fact, even to those human programmers who wrote the initial program for a machine learning system, it may be extremely difficult to explain or recreate the AI's decision-making.[62] Ultimately, the more

51. *See* Geoffrey E. Hinton, Simon Osindero & Yee-Whye Teh, *A Fast Learning Algorithm for Deep Belief Nets*, 18 NEURAL COMPUTATION 1527, 1527 (2006).

52. *See* Ian J. Goodfellow, Jean Pouget-Abadie, Mehdi Mirza, Bing Xu, David Warde-Farley, Sherjil Ozair, Aaron Courville & Yoshua Bengio, *Generative Adversarial Nets*, *in* 27 ADVANCES IN NEURAL INFORMATION PROCESSING SYSTEMS 1, 1 (Z. Ghahramani, M. Welling, C. Cortes, N. Lawrence & K.Q. Weinberger eds., 2014). Some generative AI models, such as Bard and ChatGPT, use generative adversarial networks, but others do not.

53. Vaswani et al., *supra* note 32.

54. Kalley Huang, *Alarmed by A.I. Chatbots, Universities Start Revamping How They Teach*, N.Y. TIMES (Jan. 16, 2023), https://www.nytimes.com/2023/01/16/technology/chatgpt-artificial-intelligence-universities.html.

55. Julia Angwin, Jeff Larson, Surya Mattu & Lauren Kirchner, *Machine Bias*, PROPUBLICA (May 23, 2016), https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing.

56. STABILITY.AI, https://stability.ai (last visited Dec. 15, 2024).

57. *See generally* Peng Zhang & Maged N. Kamel Boulos, *Generative AI in Medicine and Healthcare: Promises, Opportunities and Challenges*, 15 FUTURE INTERNET 286 (2023) (discussing AI impacting how patients receive care).

58. Robin C. Feldman & Kara Stein, *AI Governance in the Financial Industry*, 27 STAN. J.L. BUS. & FIN. 94 (2022).

59. *See* Iain M. Cockburn, Rebecca Henderson & Scott Stern, *The Impact of Artificial Intelligence on Innovation: An Exploratory Analysis*, *in* THE ECONOMICS OF ARTIFICIAL INTELLIGENCE 115, 143 (Ajay K. Agrawal, Joshua Gans, & Avi Goldfarb eds., 2019) (documenting empirically a "striking shift . . . toward deep learning-based application-oriented research").

60. INVENTING AI, *supra* note 40, at 2.

61. FRANK A. PASQUALE, THE BLACK BOX SOCIETY: THE SECRET ALGORITHMS THAT CONTROL MONEY AND INFORMATION 3 (2015).

62. *See, e.g.*, Karen McGregor Richmond et al., Explainable AI and Law: An Evidential Survey, CTR. OF EXCELLENCE FOR GLOB. MOBILITY L. 1, 6 (2023) ("[Cutting edge AI] models are fundamentally "black-boxed", the method by which the algorithm arrives at its decisions having been based on correlations between features

advanced AI systems become, the greater their likely impact on society—and the more important it will be for stakeholders to have confidence that the AI's decision-making process is sound.[63] Especially in public, high-stake scenarios, society is already experiencing calls for greater transparency and explainability.[64]

Beyond transparency, the breathtaking speed and potential impact of AI inspires many commentators, including those involved in producing and developing cutting-edge AI, to call for deep and thoughtful consideration of AI's future impact on society.[65] Looming questions include to what extent AI will: affect humans' mental, social, and physical abilities,[66] ease or exacerbate disparities,[67] impact diverse job and economic sectors,[68] contribute or mitigate issues related to climate change, and even "go-rogue" by possibly injuring, enslaving, or destroying human life.[69] This article, however, only explores the intersection of AI and intellectual property. We will leave the deeper moral questions, important as they are, to others.

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which are not logically derived, and frequently not apprehensible to humans"); Bartosz Brozek et al., The black box problem revisited. Real and imaginary challenges for automated legal decision making, 32 A.I. & L. 427, 427 (2023) ("[W]e often do not know *how* or *why* the [AI model] go to the proposed solution"). The degree to which a human observer can intrinsically understand the cause of a model's decision is described by the machine learning community as an Al system's "interpretability" or "explainability." *Id.* at 428, 428 n.1 (noting that explainability of AI model refers to the transparency of the internal decision making processes of that AI model and also commenting that the terms "explainability" and "interpretability" are used interchangeably). *But see* Boris Babic & I. Glenn Cohen, *The Algorithmic Explainability "Bait and Switch"*, 108 MINN. L. REV. 857, 869 (2023) ("Explainability is very different from interpretability").

63. Robin C. Feldman, Address at the USPTO AI Inventorship Listening Session—East Coast (Feb. 12, 2023) (unpublished comments on file with author).

64. *See, e.g.*, Julia Amann, Alessandro Blasimme, Effy Vayena, Dietmar Frey & Vince I. Madai, *Explainability for Artificial Intelligence in Healthcare: A Multidisciplinary Perspective*, 20 BMC MED. INFORMATICS DECISION MAKING 310 (2020) (identifying AI literature relevant to determining the necessity and role of explainability in healthcare domain).

65. *See* Scherer, *supra* note 36, at 355–56 (summarizing tech leaders' concerns and desire for regulation of AI); Kevin Roose, *A.I. Poses 'Risk of Extinction,' Industry Leaders Warn*, N.Y. TIMES (May 30, 2023), https://www.nytimes.com/2023/05/30/technology/ai-threat-warning.html (describing "open letter . . . signed by more than 350 executives, researchers and engineers working in A.I." on the "risk of extinction" from AI).

66. *See, e.g.*, NICOLAS CARR, THE SHALLOWS: WHAT THE INTERNET IS DOING TO OUR BRAINS (2010) (questioning how use of internet might lead to sacrificing of human ability to read and think deeply); *Ledger of Harms*, CTR. FOR HUMANE TECH. (June 2021), https://ledger.humanetech.com (compiling diverse harms related to AI-powered digital platform use, including those related to "Physical and Mental Health" and "Social Relationships").

67. *See, e.g.*, Angwin et al., *supra* note 55 (exemplifying embedded racial bias in risk assessment algorithm used to support courtroom sentencing); CODED BIAS (7th Empire Media 2020) (highlighting race and gender biases embedded in artificial intelligence technologies).

68. *See, e.g.*, Daron Acemoglu, David Autor, Jonathan Hazell & Pascual Restrepo, *Artificial Intelligence and Jobs: Evidence from Online Vacancies*, 40 J. LAB. ECON. (SPECIAL ISSUE) S293 (2022); James Bessen, *Artificial Intelligence and Jobs: The Role of Demand*, *in* THE ECONOMICS OF ARTIFICIAL INTELLIGENCE 291, 301 (Ajay K. Agrawal, Joshua Gans & Avi Goldfarb eds., 2019) ("[I]mportance of demand in mediating the impact of [AI] automation").

69. Rothman, *supra* note 14 (AI's "existential risk" of AI); Roose, *supra* note 14 ("P(doom)"); *see* Scherer, *supra* note 36, at 355–56; Roose, *supra* note 65 and accompanying text.

II. THEORETIC UNDERPINNINGS OF INTELLECTUAL PROPERTY

The theoretic underpinnings of intellectual property in the United States reach back to the nation's founding and beyond. From the nation's outset, however, most intellectual property regimes in this country have been largely grounded in utilitarianism, although others exhibit strains of the rights-based concept of non-consequentialism.

A. UNDERSTANDING UTILITARIANISM AND NON-CONSEQUENTIALISM

Consequentialism, the general moral theory underlying utilitarianism, posits that an action's value lies in the cumulative consequences that will stem from that action.[70] Utilitarianism refines the theory by adopting a concept for embodying individual consequences and a method of evaluating all of those consequences together: Specifically, the effects of a decision are measured in terms of the impact on the *well-being of individuals*, followed by summing up the individual positive effects and the individual negative effects; the total of the positive and negative effects are then weighed against each other in a cost-benefit analysis.[71] Further refining these concepts, the utilitarian approach most familiar to readers is known as maximization. With maximization, an action is justified if it yields the greatest benefit overall when compared to all other courses of action, including doing nothing.[72]

In contrast to utilitarianism, non-consequentialism evaluates judgements not by their downstream consequences, but rather by their adherence to specific moral norms, such as justice or individual rights.[73] In other words, core values matter most.

To understand the difference between utilitarianism and non-consequentialism, consider the old chestnut for teaching legal jurisprudence, the trolley car case. A runaway trolley car is headed for a collision with a crowd of thirty pedestrians. You have the opportunity to divert the trolley so that it hits only one pedestrian standing on a different corner. Would you divert the trolley?

A consequentialist might argue that one should divert the trolley because diverting the trolley leads to the death of only one person, which is a greater balance of good over evil than inaction, which leads to the death of thirty times more people. A non-consequentialist who believes that intentionally taking a life

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70. *See* Amartya Sen & Bernard Williams, *Introduction* to UTILITARIANISM AND BEYOND 1, 3–5 (Amartya Sen & Bernard Williams, eds., 1st ed. 1982); SAMUEL SCHEFFLER, THE REJECTION OF CONSEQUENTIALISM 1 (1st ed. 1982). For further discussion, see Robin Feldman, *Consumption Taxes and the Theory of General and Individual Taxation*, 21 VA. TAX REV. 293, 303–14, 304 n.16, 311 n.47 (2002) (explaining sub-theories of consequentialism and non-consequentialism and identifying other terms used in modern legal discourse, such as "teleological," "deontological" and "rights-based theories").

71. Julia Driver, *The History of Utilitarianism*, THE STANFORD ENCYCLOPEDIA OF PHIL. (Sept. 22, 2014), https://plato.stanford.edu/entries/utilitarianism-history; *see also* Sen & Williams, *supra* note 70, at 3–5.

72. WILLIAM K. FRANKENA, ETHICS 14 (2d ed. 1973).

73. SCHEFFLER, *supra* note 70, at 4–5; F. M. KAMM, INTRICATE ETHICS: RIGHTS, RESPONSIBILITIES, AND PERMISSIBLE HARM 11 (Derek Parfit ed., 2007).

is always improper, no matter the consequences, might argue that one should *not* divert the trolley because, with diversion, you would intentionally take a pedestrian's life.

As another example, consider the following real-life experiment. In the mid-twentieth century, millions of people were in grave danger of famine due to World War II. In response to scant literature on the effects of long-term dietary restrictions and the effectiveness of strategies for dietary rehabilitation, physiologist Ancel Keys designed and conducted what is now infamously known as the Minnesota Starvation Experiment.[74] In the study, 36 volunteers—conscientious objectors in the Civilian Public Service—were submitted to the "starvation-phase" of the experiment.[75] During this 24-week period, each participant lost an average of twenty-five percent of their control-level body weight, before rehabilitating through one of four prescribed rehabilitation diets.[76] From his meticulously recorded notes, Keys shared vital insights from the Minnesota Starvation Experiment with aid workers across Europe and Asia after the war.[77] A 1400-page full report, entitled *The Biology of Human Starvation*, was published 5 years later and is still widely cited.[78]

In the non-consequentialist world of today's medical ethics, experiments that deliberately inflict harm on healthy individuals are deemed unacceptable regardless of their potential benefit. Instead of any balancing of good consequences and bad consequences, moral norms such as the Hippocratic Oath's "do no harm" principle guide decision-making.[79] To summarize, utilitarianists, using the popular refinement of maximization, evaluate actions based on the resulting state of affairs while non-consequentialists consider core values the better method of judging an action (independent of consequences). This distinction becomes relevant as the article reviews each of the four traditional pillars of intellectual property law.

B. THE CONSTITUTION-BASED INTELLECTUAL PROPERTY REGIMES: A BRIEF TOUR

The United States' patent and copyright laws are explicitly and unabashedly utilitarian. Although some scholars have argued that early aspects of the nation's history reflect varying strains of thought, and some of our treaty

74. 1 ANCEL KEYS, JOSEF BROŽEK, AUSTIN HENSCHEL, OLAF MICKELSEN & HENRY L. TAYLOR, THE BIOLOGY OF HUMAN STARVATION 63–78 (1950).

75. *Id.* at 63–66.

76. *Id.* at 74–78.

77. HAROLD STEERE GUETZKOW & PAUL HOOVER BOWMAN, MEN AND HUNGER: A PSYCHOLOGICAL MANUAL FOR RELIEF WORKERS 11–12 (1946) (noting that this book was published so that aid workers can take advantage of the lessons learnt from the Minnesota Starvation Experiment); TODD TUCKER, THE GREAT STARVATION EXPERIMENT: ANCEL KEYS AND THE MEN WHO STARVED FOR SCIENCE 183–184 (Univ. of Minn. Press 2007) (2006) (noting that the insights from the Minnesota Starvation Experiment greatly helped relief works in their task of helping the hungry and victims of famines after the second world war).

78. *See generally id.* (definitive treatise on the starvation and rehabilitation of man).

79. *See* DAVID LYONS, FORMS AND LIMITS OF UTILITARIANISM, at vii (1st ed. 1965).

obligations related to copyright echo European notions of moral rights,[80] most agree that our patent and copyright laws have rested firmly on utilitarian grounds for centuries.[81]

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80. The United States adheres to several multinational treaties that refer to moral rights in the context of copyright and performing rights for singers and actors, including the Berne Convention, the WIPO Copyright Treaty, and the WIPO Performances and Phonograms Treaty. *See* Berne Convention for the Protection of Literary and Artistic Works art. 11bis (2), Sept. 28, 1979, S. TREATY DOC. NO. 99-27, 1161 U.N.T.S. 3; WIPO Copyright Treaty, Dec. 20, 1996, S. TREATY DOC. NO. 105-17, 2186 U.N.T.S. 121; WIPO Performances and Phonograms Treaty art. 5, Dec. 20, 1996, S. TREATY DOC. NO. 105-17, 2186 U.N.T.S. 203.

81. For utilitarian basis of patent law, see, for example, Alan J. Devlin & Neel U. Sukhatme, *Self-Realizing Inventions and the Utilitarian Foundation of Patent Law*, 51 WM. & MARY L. REV. 897, 913 (2009) ("[A]cademic commentators have resoundingly embraced the position that patent law exists to promote purely utilitarian concerns. More importantly, the U.S. Supreme Court has consistently reaffirmed the same view on several occasions."); Adam Mossoff, *Who Cares What Thomas Jefferson Thought About Patents? Reevaluating the Patent "Privilege" in Historical Context*, 92 CORNELL L. REV. 953, 962 n.41, 963–65 (2007) ("Although scholars today identify many operative policies in patent law, these policies are only different applications of the same utilitarian, incentive-creating theory."); FRITZ MACHLUP, STAFF OF S. SUBCOMM. ON PATENTS, TRADEMARKS, AND COPYRIGHTS, 85TH CONG., STUDY OF AN ECONOMIC REVIEW OF THE PATENT SYSTEM 33 (Comm. Print 1958) ("The thesis that the patent system may produce effective profit incentives for inventive activity and thereby promote progress in the technical arts is widely accepted."); Brief for Tyler T. Ochoa, Mark Rose, Edward C. Walterscheid, the Org. of Am. Historians & H-Law: Humans. & Soc. Scis. Online as Amici Curiae Supporting Petitioners at 11, 28–29, Eldred v. Ashcroft, 537 U.S. 186 (2003) (No. 01-618), 2002 WL 1051765, at *11, *28–29 ("In America, as in England, proponents of the natural right view of copyright repeatedly sought a perpetual copyright; . . . the term of copyright was instead strictly limited in order to serve the public interest; and . . . it took an authoritative decision by the highest court in the land to firmly establish the utilitarian rationale as the dominant rationale for copyright.") (discussing Wheaton v. Peters, 29 F. Cas. 862 (C.C.E.D. Pa. 1832) (No. 17,486), and explaining that "[i]n rejecting Wheaton's claim of perpetual common-law copyright, the U.S. Supreme Court confirmed the utilitarian view embodied in the Constitution that patents and copyrights are exclusive rights of limited duration, granted in order to serve the public interest in promoting the creation and dissemination of new works"); Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 480 (1974) ("The patent laws promote this progress [of Science and useful Arts] by . . . offering a right of exclusion for a limited period as an incentive to inventors to risk the often enormous costs in terms of time, research, and development. The productive effort thereby fostered [by patent laws] will have a positive effect on society through the introduction of new products and processes of manufacture into the economy, and the emanations by way of increased employment and better lives for our citizens."). For utilitarian basis of copyright law, see, for example, Jeanne C. Fromer, *Expressive Incentives in Intellectual Property*, 98 VA. L. REV. 1745, 1750–51, n.22, n.24 (2012) ("The Supreme Court, Congress, and many legal scholars consider utilitarianism the dominant purpose of American copyright . . . law."); William W. Fisher III, *Reconstructing the Fair Use Doctrine*, 101 HARV. L. REV. 1659, 1703 (1988) ("[T]o avoid underproduction of original works, it is necessary to empower the creators of such works to charge fees for the privilege of using them, but granting the creators that right causes monopoly losses, which vary between types of copyrighted works. The task of a lawmaker who wishes to maximize efficiency, therefore, is to determine, with respect to each type of intellectual product, the combination of entitlements that would result in economic gains that exceed by the maximum amount the attendant efficiency losses."). A number of rights-based (deontological) theories have been proposed. One of the most common rights-based theories is the natural right theory, which posits a creator should have ownership over their creations. This theory follows a Lockean philosophy tying work to (intellectual) property rights. *See* Justin Hughes, *The Philosophy of Intellectual Property*, 77 GEO L.J. 287, 297 (1988) (discussing Locke's theory of property); HELEN NORMAN, INTELLECTUAL PROPERTY LAW: DIRECTIONS 89 (2d ed. 2014). The moral/desert theory, the personal autonomy theory, the personhood theory, and the human rights-based theory are all variations on the natural rights theory. The moral/desert theory posits that a creator of a work deserves control over its use. *See* Lawrence C. Becker, *Deserving to Own Intellectual Property*, 68 CHI.-KENT L. REV. 609, 620 (1993). The personal autonomy theory posits that personal autonomy must involve recognizing the right of control over things of close association. TANYA APLIN & JENNIFER DAVIS, INTELLECTUAL PROPERTY LAW:

The authorizing language of the Constitution itself describes the purpose of the patent and copyright regimes in utilitarian terms, granting Congress the power to secure rights for authors and inventors for the specific, societal purpose of promoting the progress of the science and the useful arts.[82] In other words, the Constitution does not describe patents and copyrights as the moral rights of authors and inventors or as a matter of fairness to them. Rather, authors and inventors are the vehicle for ensuring a societal benefit to all.[83] The Supreme Court reiterated the utilitarian calculus of patent law in *Graham v. John Deere*: "[t]he patent monopoly was not designed to secure to the inventor his natural right in his discoveries. Rather, it was a reward, an inducement, to bring forth new knowledge."[84]

The utilitarian calculus recognizes the "appropriability problem" of inventions, which holds that if information about an invention is available to all, an inventor could not recover the research and development costs of producing the invention in the first place.[85] This would likely lead to a much lower and indeed suboptimal level of innovation.[86] With a time-limited, exclusive right to the invention, a market can be formed without the threat of "free-riders," who might appropriate these intangible informational goods.[87]

A similar calculus operates in copyright. Once an author completes a creative work, the cost of reproduction is often minimal. Without copyright protection, authors must compete against others who have not incurred the cost of producing a new creative work and, therefore, can sell their copies at a substantially reduced price. Given that authors must match that price to attract customers, they may be unable to recover the time and resources invested in

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TEXTS, CASES, AND MATERIALS 63 (3d ed. 2017). Finally, personhood theory posits that the act of creation entails the choice of expression, an embodiment of the creator's personality. Control over the creation becomes necessary to secure the creator's personality. Margaret J. Radin, *Property and Personhood*, 34 STAN. L. REV. 957, 957, 959–61 (1982); Hughes, *supra*, at 330. The human rights-based theory posits intellectual property rights are human property that warrant protection for one's use and disposal. The human rights theory differs from the foundational natural right theory in that it draws its rhetorical strength from international human rights conventions rather than divine rights. *See* J. Janewa Osei-Tutu, *Humanizing Intellectual Property: Moving Beyond the Natural Rights Property Focus*, 20 VAND. J. ENT. & TECH. L. 207, 223–26 (2017). These theories have been criticized. *See* F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 698 n.2 (2001) ("Yet those natural rights theories tying invention to inventor leave many questions unanswered. Assuming inventions are the natural property of the inventor, what rights do simultaneous inventors have? Should independent origination be a complete defense to patent infringement as it is for copyright infringement? More fundamentally, should the patent right include some affirmative right to use?"); Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625, 626–27 (2002).

82. U.S. CONST. art. I, § 8, cl. 7.

83. One should note that this constitutional language contains an explicit definition of what constitutes the "good" to be maximized, specifically, the progress of science. *See id.*

84. Graham v. John Deere Co., 383 U.S. 1, 9 (1966).

85. Kenneth W. Dam, *The Economic Underpinnings of Patent Law*, 23 J. LEGAL STUD. 247, 247 (1994).

86. *Id.*; *see* Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, *in* THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS 609, 614–15 (1962).

87. Lemley, *supra* note 5, at 1033–46 (describing and criticizing the free riding problem as misguided).

creation.[88] Once again, the result would be discouraging authors from producing and sharing creative works.[89] In addition, the lack of copyright protections can create an incentive to be the first in the market, at the expense of quality, devaluing pre-publishing activities and diligent copy-editing.[90] Once again, in this utilitarian calculus, society suffers from a reduced level of creative works, rather than a promotion of the progress of creative works.

C. THE NON-CONSTITUTIONAL INTELLECTUAL PROPERTY REGIMES: A BRIEF TOUR

Although the patent and copyright regimes hold constitutional pedigrees, the regimes of trademark and trade secret have more convoluted histories and theoretical bases. Within these meandering histories, some aspects of the theoretical underpinnings reflect utilitarianism and some reflect non-consequentialism.

For example, there is a wide consensus today among both commentators and courts[91] that the prevailing theoretical justification for U.S. trademark law is the consumer "search cost theory."[92] The search cost theory posits that "trademark law operates to enable consumers to rely on trademarks as repositories of information about the source and quality of products, thereby reducing the costs of searching for goods that satisfy their preferences."[93] This

88. *See* Fisher III, *supra* note 81, at 1700 ("[I]nventions and works of art that would be worth more to consumers than the costs of creating them will not be created because the monetary incentives for doing so are inadequate. . . . By granting inventors and artists a type of property right in their products, the law induces creative persons to develop and exercise their talents and thereby avoids the underproduction of useful ideas and original forms of expression."); *see also* William M. Landes & Richard A. Posner, *An Economic Analysis of Copyright Law*, 18 J. LEGAL STUD. 325, 326 (1989) (describing the issue while noting the importance of striking the correct balance between "the costs of limiting access to a work against the benefits of providing incentives to create the work in the first place").

89. Landes & Posner, *supra* note 88.

90. *Id.* at 331–32.

91. *See* Qualitex Co. v. Jacobson Prod. Co., 514 U.S. 159, 163–64 (1995) ("In principle, trademark law, by preventing others from copying a source-identifying mark, 'reduce[s] the customer's costs of shopping and making purchasing decisions,' . . . [and] helps assure a producer that it (and not an imitating competitor) will reap the financial, reputation-related rewards associated with a desirable product." (quoting 1 J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 2.01[2], at 2–3 (3d ed. 1994))); Union Nat'l Bank of Tex., Laredo, Tex. v. Union Nat'l Bank of Tex., Austin, Tex., 909 F.2d 839, 844 (5th Cir. 1990) ("The idea is that trademarks are 'distinguishing' features which lower consumer search costs and encourage higher quality production by discouraging free-riders.").

92. *See generally* Mark P. McKenna, *The Normative Foundations of Trademark Law*, 82 NOTRE DAME L. REV. 1839, 1844–49 (2007) (describing commentators' approach to consumer search costs theory as the normative basis for trademark law); Sonia K. Katyal & Aniket Kesari, *Trademark Search, Artificial Intelligence, and the Role of the Private Sector*, 35 BERKELEY TECH. & L.J. 501, 509–14 (2020) (analyzing the role of trademarks in reducing consumer search costs).

93. McKenna, *supra* note 20, at 73; *see* William M. Landes & Richard A. Posner, *Trademark Law: An Economic Perspective*, 30 J.L. & ECON. 265, 270, 275 (1987) (describing the reduction of consumer search costs as the "essential economic function of trademarks" and arguing that a firm's incentive to invest in maintaining a strong mark is dependent on its ability to maintain the quality of their products); Mark A. Lemley, *The Modern Lanham Act and the Death of Common Sense*, 108 YALE L.J. 1687, 1690 (1999) (suggesting that trademarks also assist the complex long-term spread across large geographies, i.e., franchising).

theory, conceived by the influential Law and Economics scholars William Landes and Richard Posner, is "rampant in the literature, and widely embraced by courts."[94]

As with patent and copyright, the search cost theory rests on a utilitarian foundation. Improving search costs strengthens the ability of consumers on the whole to better and more efficiently satisfy their desires in the marketplace. In an additional parallel to patent and copyright, the search cost theory focuses on consumers, with the granting of rights to producers serving as a vehicle for enhancing consumer welfare.

Focusing solely on search cost theory, however, ignores the rich and varied history of U.S. trademark law prior to this late twentieth century adoption.[95] Early U.S. trademark law was largely *producer*-focused,[96] with court opinions suggesting that trademark law protected against diversions of trade or customers via fraud[97] or deception, also known as "passing off."[98] Passing-off theory lead many courts and scholars to house early trademark law within the field of unfair competition law.[99] Thus, one can see this era of trademark essentially in non-consequentialist terms. Producers' rights were protected, along with the morality

94. McKenna, *supra* note 92, at 1845.

95. This paper includes histories only of American law. For histories that touch on English law and accounts that go further back in time, see generally FRANK I. SCHECHTER, THE HISTORICAL FOUNDATIONS OF THE LAW RELATING TO TRADE-MARKS (1925); Sidney A. Diamond, *The Historical Development of Trademarks*, 65 TRADEMARK REP. 265 (1975); Benjamin G. Paster, *Trademarks—Their Early History*, 59 TRADEMARK REP. 551 (1969); Edward S. Rogers, *Some Historical Matter Concerning Trade-Marks*, 9 MICH. L. REV. 29 (1911). *See also* McKenna, *supra* note 92, at 1848–58 (describing early American trademark law); Daniel M. McClure, *Trademarks and Unfair Competition: A Critical History of Legal Thought*, 69 TRADEMARK REP. 305, 310–14 (1979) (describing trademark law's "formative period," beginning with the Roman Empire).

96. *See, e.g.*, Coats v. Holbrook, 2 Sand. Ch. 586, 594 (1845) ("[A person] has no right, and he will not be allowed, to use the names, letters, marks, or other symbols by which he may palm off upon buyers as the manufactures of another, the article he is selling; and thereby attract to himself the patronage that without such deceptive use of such names . . . would have enured to the benefit of that other person . . . ."); *see also* McKenna, *supra* note 92, at 1841 ("[T]rademark law, like all unfair competition law, sought to protect producers from illegitimate diversions of their trade by competitors.").

97. McClure, *supra* note 95, at 315 ("The early development of trademark law in America was thus firmly based on notions of morality, focusing on the fraudulent activity of the defendant.").

98. JAMES L. HOPKINS, THE LAW OF TRADEMARKS, TRADENAMES AND UNFAIR COMPETITION § 1, at 1 (Callaghan & Co. 2d ed. 1905) ("Unfair competition consists in passing off one's goods as the goods of another, or in otherwise *securing patronage that should go to another*, by false representations that lead the patron to believe that he is patronizing the other person." (emphasis added)); McKenna, *supra* note 92, at 1841, 1865 ("In fact, courts denied relief in many early trademark cases despite clear evidence that consumers were likely to be confused by the defendant's use. Invariably they did so because the plaintiff could not show that the defendant's actions were likely to divert customers who otherwise would have gone to the plaintiff.") ("Importantly, this formulation did not depend on whether the case involved a claim of trademark infringement or unfair competition. In both types of cases, courts primarily focused on a producer's diverted trade, sometimes mentioning the public's interest as well.").

99. *See* HOPKINS, *supra* note 98 ("Unfair competition consists in passing off one's goods as the goods of another, or in otherwise *securing patronage that should go to another*, by false representations that lead the patron to believe that he is patronizing the other person." (emphasis added)); McKenna, *supra* note 92, at 1860 ("Because the purpose of trademark protection traditionally was to prevent trade diversion by competitors, it has long been regarded as a species of the broader law of unfair competition, and even more broadly, as part of the law governing other fraudulent (and unfair) business practices.").

of the marketplace, with both concerns reflecting sets of values to be enhanced. Following that time, the formalist period of U.S. legal jurisprudence in the late nineteenth century underscored the producer-rights theory in property rights, which became the unifying principle in trademark law.[100] Thus, these periods conceptualized trademark in non-consequentialist terms—protecting producers' rights, the morality of the marketplace, and property rights—thus reflecting the relevant core values.

By the early twentieth century, legal realist courts and scholars began calling into question the natural-rights conceptualization of trademarks as property.[101] In contrast, legal realists justified trademark law with arguments of protecting business goodwill.[102] More importantly, protecting the public from confusion and deception replaced property justifications as the main rationale for trademark law.[103] Legal realists achieved this shift by drawing on analyses of economics and other social sciences to analyze the effect of trademarks on the marketplace.[104] Over the course of the twentieth century, economic analysis

100. Daniel M. McClure, *Trademarks and Competition: The Recent History*, 59 LAW & CONTEMP. PROBS. 13, 15 (1996); *see also* McClure, *supra* note 95, at 317–18, 323–24 ("But it was the development of the 'property' concept as a unifying principle in trademark law that was the cornerstone of the rising structure of legal formalism in the late nineteenth century . . . [t]he furthest extension of the concept of 'protection of property' to expand protection of trademarks was proposed in 1927 by Frank I. Schechter in his famous article, 'The Rational Basis of Trade-Mark Protection.' Schechter argued against the traditional formulation of the function of a trademark as an indicator of source or origin of the goods."); McKenna, *supra* note 92, at 1860 n.91 (citing to cases and commentary supporting the property-based conception of trademark law).

101. McClure, *supra* note 95, at 327 ("The lack of uniformity in decisions and the tenuousness of deriving rules from the 'property' conception became more and more apparent. The arbitrariness and inconsistency of the application of the rules became glaringly clear. '[T]he charge against conceptualism was that it was mystification: there simply was no deductive process, by which one could derive the "right" legal answer from abstractions like freedom or property.'" (citing Duncan Kennedy, *Form and Substance in Private Law Adjudication*, 89 HARV. L. REV. 1685, 1748 (1976))). For a more in-depth rationale of realism, see McClure, *supra* note 95, at 327–29.

102. McClure, *supra* note 95, at 329. This point in time is a good example of the concern for monopoly that stemmed from trademark law. McKenna, *supra* note 92, at 1897 ("At various points during its history, opponents of trademark protection had argued that granting one party the exclusive right to use a particular mark was tantamount to granting a monopoly.").

103. *See* McKenna, *supra* note 92, at 1898 ("Significantly, as courts and commentators began to embrace the consumer protection theory as a justification for claims by producers, courts stopped referring to separate actions by consumers for fraud or deceit.").

104. Realist economist Edward Chamberlin is seen by many as the most influential advocate for this analysis of trademarks on the economy. *See generally* EDWARD H. CHAMBERLIN, THE THEORY OF MONOPOLISTIC COMPETITION: A RE-ORIENTATION OF THE THEORY OF VALUE (3d ed. 1938) (drawing on economics to analyze trademark law); *see, e.g.*, McClure, *supra* note 100 (attributing the "economic theory attack on trademark protection" to being "triggered by a seminal book by economist Edward H. Chamberlin that presented a reasoned case against trademarks as reinforcing monopoly power"); HERBERT HOVENKAMP, THE OPENING OF AMERICAN LAW: NEOCLASSICAL LEGAL THOUGHT, 1870-1970, at 198 (2014) ("Edward Chamberlin's ground-shifting book on *Monopolistic Competition* (1933) pursued the relationship between IP rights and product differentiation. . . . Chamberlin's work was appealing to the Legal Realists, reinforcing their view that markets themselves are often instruments of coercion.").

was retooled to frame trademark law as pro-competitive,[105] eventually drawing on the economic theories of the Chicago school in the 1980s.[106] Today, consumer confusion and consumer search cost theories have shifted the trademark field to utilitarianism, framed in terms of consumers but operating to protect trademark holders.[107]

Turning from trademark to trade secret, the main goal of trade secret law is the "protection of valuable business information that is not widely known or readily ascertainable from misappropriation."[108] Unfortunately, the theoretical and definitional[109] underpinnings that support this goal are much less so.[110] In fact, one constant trait of trade secret law seems to be its state of "muddle" and "disarray."[111]

Such confusion likely stems from the nature and history of trade secret law. Trade secret protection began as a state common law doctrine related to unfair

105. Trademarks have always been closely related to the broader field of unfair competition law. Throughout this history, scholars have oscillated between framing trademarks as pro/anti-competitive. One of the significant influences of the Chicago school on trademark law was to use price theory to frame trademark expansion as benefiting consumers. *See* McClure, *supra* note 95, at 346–56.

106. McClure, *supra* note 100, at 28 ("Just as the Chicago School theorists have come to dominate thinking in antitrust law, so has the Chicago School influenced the development of basic trademark law."); *see id.* at 19–25 (describing how Chicago school influence affected trademark, unfair competition, and antitrust law).

107. McKenna, *supra* note 20, at 71 ("As a descriptive matter, courts did not elevate confusion to this central status because they had consumers' interests at heart; indeed, most of trademark law's expansive confusion doctrines were developed, often explicitly, for the purpose of protecting mark-owner interests. But courts have had no trouble casting their decisions in consumer protection terms since their emphasis on confusion is so compatible with the dominant theoretical account of trademark law—namely, the search costs theory. Anything that can be characterized in confusion-based terms seems to raise search costs, and if search costs are the harm to be avoided, then anything that causes confusion ought to be at least prima facie actionable."). In fact, one of the significant influences of the Chicago school on trademark law was to use price theory to frame trademark expansion as benefiting consumers; *see* McClure, *supra* note 100, at 21 ("The Chicago School economists contended that trademarks (and advertising) were actually pro-competitive because they lower consumer search costs, facilitate entry by new competitors, and generate quality-control incentives.").

108. *See, e.g.*, Vincent Chiappetta, *Myth, Chameleon or Intellectual Property Olympian? A Normative Framework Supporting Trade Secret Law*, 8 GEO. MASON L. REV. 69, 73 (1999) (arguing that trade secrets "basic focus" is the misappropriation of information); Mark A. Lemley, *The Surprising Virtues of Treating Trade Secrets as IP Rights*, 61 STAN. L. REV. 311, 312 (2008) ("While scholars periodically disagree over the purposes of the law . . . they seem to agree that misappropriation of trade secrets is a bad thing that the law should punish."); Michael Risch, *Why Do We Have Trade Secrets?*, 11 MARQ. INTELL. PROP. L. REV. 1, 43 (2007) ("[I]ronically, the law of trade secrets is necessary to cause less money to be spent on the protection of secrets, and as a result to cause less money to be spent by those trying to appropriate someone else's trade secrets, even if that means misappropriation is successful more often.").

109. The history of American trade secret law has been filled with definitional difficulties. For example, the Restatement (First) of Torts stated that "[a]n exact definition of a trade secret is not possible." RESTATEMENT (FIRST) OF TORTS § 757 cmt. b (AM. L. INST. 1939).

110. For a history of trade secret law in the United States, see generally Sharon K. Sandeen, *The Evolution of Trade Secret Law and Why Courts Commit Error When They Do Not Follow the Uniform Trade Secrets Act*, 33 HAMLINE L. REV. 493 (2010); *see also* Lemley, *supra* note 108, at 312 n.1 (citing law review articles showing treatment of trade secret law and theory); *see generally* Suzana Nashkova, *Defining Trade Secrets in the United States: Past and Present Challenges—A Way Forward?*, 54 INT'L REV. INTELL. PROP. & COMP. L. 634 (2023) (discussing the difficulties in defining trade secret law in United States history).

111. *See* Chiappetta, *supra* note 108, at 69 ("United States trade secret law is in a state of disarray."); Robert G. Bone, *A New Look at Trade Secret Law: Doctrine in Search of Justification*, 86 CALIF. L. REV. 241, 304 (1998) ("Trade secret law is in a muddle today.").

competition and then became codified in state statutes over time, particularly through the Uniform Trade Secrets Act.[112] The protection eventually became codified in federal statutes, which in turn rely heavily on the relevant state's own doctrines.[113] From this accumulation of case law, a variety of justifications emerge to support trade secret protection. These include: property rights,[114] the regulation of unfair competition, economic efficiency,[115] commercial ethics, encouragement of invention,[116] and relational duties, among others.[117]

Some court cases themselves contain a mixture of justifications. Though not the first case[118] pertaining to trade secrecy, the Massachusetts Supreme Court's 1868 opinion in *Peabody v. Norfolk* is seen by many as the first dictum on the subject.[119] Justice Gray begins with a policy statement on promoting innovation[120] (a utilitarian, outcomes-based approach) but then focuses the rest of his opinion on a Lockean tying of trade secrets to *property*: "If a man establishes a business and makes it valuable by his skill and attention, the good will of that business is recognized by the law as property."[121]

Despite the intermingling of *Peabody*, however, normative justifications for trade secrets are commonly understood as initially beginning with a

112. *Trade Secret*, CORNELL LEGAL INFO. INST., https://www.law.cornell.edu/wex/trade_secret (last visited Dec. 15, 2024) (noting that, as of 2024, forty-eight states have enacted Uniform Trade Secrets Act and prior to the development of Uniform Trade Secrets Act, trade secret protections were grounded in common law); *see also, supra* note 110.

113. *See supra* note 110.

114. *See* Ruckelshaus v. Monsanto Co., 467 U.S. 986, 1002–03 (1984) ("This general perception of trade secrets as property is consonant with a notion of 'property' that extends beyond land and tangible goods and includes the products of an individual's 'labour and invention.'") (citing to 2 WILLIAM BLACKSTONE, COMMENTARIES *405); Pamela Samuelson, *Information as Property: Do* Ruckelshaus *and* Carpenter *Signal a Changing Direction in Intellectual Property Law?*, 38 CATH. U. L. REV. 365, 398 (1989) ("Clearly, the word property is a very powerful metaphor that radically changes the stakes in legal disputes.").

115. *See generally* Lemley, *supra* note 108 (setting out the competing theories of trade secrets); *see also* David D. Freidman, William M. Landes & Richard A. Posner, *Some Economics of Trade Secret Law*, 5 J. ECON. PERSP. 61, 71 (1991) ("The current structure of trade secret law may be the best compromise among the competing economic considerations. No stronger conclusion is possible.").

116. Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 481 (1974) ("The maintenance of standards of commercial ethics and the encouragement of invention are the broadly stated policies behind trade secret law.").

117. For discussions on the varied theoretical justifications for trade secret law, see Risch, *supra* note 108, at 15–36; Lemley, *supra* note 108, at 319–29; Bone, *supra* note 111, at 251–303.

118. The first court decision related to trade secrets was *Vickery v. Welch*, 36 Mass. (19 Pick.) 523, 534 (1837), although no specific definition of a trade secret was given.

119. Peabody v. Norfolk, 98 Mass. 452, 457 (1868); *see also* 1 MELVIN F. JAGER, TRADE SECRETS LAW § 2.02 at 2-8, 2-9 (1993) (describing *Peabody* as "a leading case in the development of the trade secret common law"); Michael J. Hutter, *Trade Secret Misappropriation: A Lawyer's Practical Approach to the Case Law*, 1 W. NEW ENG. L. REV. 1, 7 (1978) ("*Peabody v. Norfolk* is frequently cited as the seminal case for much of the development of trade secrets law in the United States."); Bone, *supra* note 111, at 252 (describing the *Peabody* opinion as "crystallizing the law of trade secrets in the United States").

120. *Peabody*, 98 Mass. at 457 ("It is the policy of the law, for the advantage of the public, to encourage and protect invention and commercial enterprise.").

121. *Id.*

grounding in property rights.[122] By the beginning of the twentieth century, however, legal positivism and legal realism moved trade secret law beyond its property origins.[123] For example, in Justice Holmes' frequently quoted early-twentieth century opinion from *DuPont v. Masland*, the Justice notably rejects property rights as a justification for trade secrets:

> The word "property" as applied to trademarks and trade secrets is an unanalyzed expression of certain secondary consequences of the primary fact that the law makes some rudimentary requirements of good faith. Whether the plaintiffs have any valuable secret or not, the defendant knows the facts, whatever they are, through a special confidence that he accepted. The property may be denied, but the confidence cannot be. Therefore, the starting point for the present matter is not property or due process of law, but that the defendant stood in confidential relations with the plaintiffs, or [at least] one of them.[124]

As the Holmes opinion makes clear, justifications for trade secrets had shifted from a focus on property to a focus on breaches of confidence and trust, which generally fell under the burgeoning field of unfair competition law.[125] Breaches of confidence and trust could be understood as another form of non-consequentialist theories, with market morality as the value protected.

Trade secret law experienced another dramatic shift in theory during the 1980s Law and Economics movement. During this time, the efficiency of informational markets became the driving rationale for trade secret's jurisprudence. Thus, trade secrets were viewed as "a means to ensure efficient production of information, because information is expensive to produce but cheap to reproduce, meaning that without exclusive rights to prevent free riding, market actors will have insufficient incentive to invest in informational goods,"[126] leading to undesired outcomes. Proponents of such a justification argued that "[t]rade secret law . . . did not aim at ensuring moral conduct [read unfair competition], but at stimulating investment in information and enabling optimal investment in secrecy."[127] Looking back across history, Graves and

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122. *See, e.g.*, Risch, *supra* note 108, at 15, 19 ("Any normative justification of trade secrets must begin with consideration of whether trade secrets are property. . . . There is no shortage of judges and scholars willing to call trade secrets 'property.'"); Bone, *supra* note 111, at 251–59 (discussing the development of a general theory of trade secret law); Lemley, *supra* note 108, at 316 ("[C]ourts periodically spoke of trade secrets as property rights, though it is not clear that they meant by that term what we mean today.").

123. Bone, *supra* note 111, at 260 ("On this view, property was not a logical entailment of fundamental truths about possession and ownership. Instead, property rights were created by positive law and were designed to serve whatever goals the community wished to pursue.").

124. Du Pont de Nemours Powder Co. v. Masland, 244 U.S. 100, 102 (1917).

125. For a helpful discussion of the historical shift towards an unfair competition approach to trade secrets law, see Bone, *supra* note 111, at 260 n.90.

126. Amy Kapczynski, *The Public History of Trade Secrets*, 55 U.C. DAVIS L. REV. 1367, 1393 (2022).

127. *See id.* at 1394. For a summary of the influence of the Law and Economics movement on intellectual property rights generally and trade secret law specifically, see *id.* at 1392–1407. *See also* Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 481 (1974) (emphasizing disclosure "will stimulate ideas and the eventual development of further significant advances in the art"); Ruckelshaus v. Monsanto Co., 467 U.S. 986, 1008–09 (1984) (noting the Federal Government "would find disclosure to be in the public interest"); RESTATEMENT (THIRD) OF UNFAIR COMPETITION § 39 cmt. b, cmt. d (AM. L. INST. 1995).

Katyal conclude that despite diffuse origins, "trade secret law . . . consolidated around a nexus of marketplace competition," which is "reflected in all official [modern] formulations of trade secret law."[128] Thus, trade secret law has settled into the utilitarian goals of encouraging investment in certain types of information.

In short, all four intellectual property regimes currently rest on utilitarian foundations. The law provides and protects patents, copyrights, trade secrets, and trademarks because on balance, the regimes benefit society as a whole, although the vehicle for ensuring that benefit may constitute protecting producers. Utilitarianism also appears in the history of all four regimes and provides the original and dominant logic for copyright and patent, reaching back to the Constitution. In the periods when non-consequentialist (rights-based) theories have appeared, the theories have rested on property rights for producers, the morality of the market including commercial ethics and unfair competition, and the moral rights of authors.

Conspicuously absent from the theoretical landscape is any consideration of the importance of preserving human contribution—at least not from the perspective that the value of human ingenuity matters in its own right.[129] Nor is there any sense that the intellectual property regimes themselves have an intrinsic value, outside of the outcomes they produce. The following Parts, *Shrinking the Pool* and *Shrinking the Value Proposition*, will examine the threats that AI brings to these and other aspects of intellectual property.

III. SHRINKING THE POOL

Around the turn of the millennium, Lawrence Lessig published a ground-breaking book[130] that he immortalized with the title of a corresponding essay, "Code is Law."[131] Lessig posited that the architecture of the internet—that is, the software and hardware—operates in the same manner as legal codes by directing, regulating, and limiting human behavior.[132] He argued that changes in

128. Graves & Katyal, *supra* note 20, at 1351.

129. For a discussion of the word "person" in the Patent Act, see *infra* text accompanying notes 134–138. For a theoretic analysis of why allowing an AI to hold patents might produce a reduced utilitarian outcome in patent law, see generally Robin Feldman & Nick Thieme, *Competition at the Dawn of Artificial Intelligence*, *in* COMPETITION LAW FOR THE DIGITAL ECONOMY 71 (Björn Lundqvist & Michal S. Gal eds., 2019).

130. LAWRENCE LESSIG, CODE: AND OTHER LAWS OF CYBERSPACE (1st ed. 1999) [hereinafter LESSIG, CODE].

131. Lawrence Lessig, *Code Is Law*, HARV. MAG., Jan. 1, 2000, https://www.harvardmagazine.com/2000/01/code-is-law-html [hereinafter Lessig, *Code Is Law*].

132. *Id.*; LAWRENCE LESSIG, CODE: VERSION 2.0, at 5 (2d ed. 2006) ("In real space, we recognize how laws regulate—through constitutions, statues, and other legal codes. In cyberspace we must understand how a different 'code' regulates—how the software and hardware (i.e., the 'code' of cyberspace) that make cyberspace what it is also *regulate* cyberspace as it is. As William Mitchell puts it, this code is cyberspace's 'law.'" (emphasis added)) [hereinafter LESSIG, CODE VERSION 2.0].

the internet's code could threaten basic values reaching back to the Constitution.[133]

Although perhaps not as grand as the concepts of liberty that Lessig had in mind,[134] recent shifts in AI are shaking the foundations of intellectual property, challenging our conceptions of what we protect and the value of human contribution to progress. The following Parts analyze the difficulties unfolding in each of the four areas of intellectual property: patent, trade secret, copyright, and trademark.

A. PATENT

Patent validity rests on satisfying five pillars of patentability, one of which mandates that the claimed invention cannot be obvious.[135] Obviousness is one of the most commonly litigated issues in patent law[136] and has been called the "fundamental gatekeeper to patenting"[137] and "the ultimate condition of patentability."[138]

Obviousness issues arise when an invention is not precisely the same as what has come before.[139] In those circumstances, the invention, although not

133. Lessig, *Code Is Law*, *supra* note 131; LESSIG, CODE VERSION 2.0, *supra* note 132, at 21 ("One important difference is this: Unlike the victims of the general searches that the Framers of our Constitution were concerned about, the computer user never knows that his or her disk is being searched by the worm.").

134. Lessig, *Code Is Law*, *supra* note 131.

135. The five elements of patentability are: patentable subject matter, novelty, nonobviousness, utility, and disclosure. 35 U.S.C. §§ 101–103, 112(a); DONALD S. CHISUM, CRAIG A. NARD, HERBERT F. SCHWARTZ, PAULINE NEWMAN & F. S. KIEFF, PRINCIPLES OF PATENT LAW 72–73 (3d ed. 2004) ("Examination is conducted to ensure that the claimed invention is adequately disclosed . . . new . . . non-nonobvious . . . useful . . . and within at least one of the statutory classes of patentable subject matter . . . ."); The Telephone Cases, 126 U.S. 1, 536 (1888) ("The law does not require that a . . . inventor, in order to get a patent for a process, must have succeeded in bringing his art to the highest degree of perfection; it is enough if he describes his method with sufficient clearness and precision to enable those skilled in the matter to understand what the process is, and if he points out some practicable way of putting it into operation."); Graham v. John Deere Co., 383 U.S. 1, 17–18 (1966) (explaining that a determination of non-obviousness is to be made after establishing "the scope and content of prior art," the "differences between the prior art and the claims at issue," and "the level of ordinary skill in the pertinent art"); Brenner v. Manson, 383 U.S. 519, 528–29, 532 (1966) (stating that "one may patent only that which is 'useful,'" and holding that the requirement that a chemical process be useful is not satisfied by showing that a "compound yielded belongs to a class of compounds now the subject of serious scientific investigation"); CHISUM ET AL., *supra*, at 324 ("[The novelty requirement] requires a patent applicant to contribute something *new* to society."); *id.* at 772 ("[T]o be patentable, the invention must fall within at least one of the four classes . . . : processes, machines, manufactures, or compositions of matter.").

136. John R. Allison, Mark A. Lemley & David L. Schwartz, *Understanding the Realities of Modern Patent Litigation*, 92 TEX. L. REV. 1769, 1769–70, 1785 (2014) (expanding on the authors' prior article from 1998, which had found obviousness the single most commonly litigated element of patentability).

137. *See* John R. Thomas, *Formalism at the Federal Circuit*, 52 AM. U. L. REV. 771, 789 (2003) (using the term).

138. *See* Dmitry Karshtedt, *Nonobviousness: Before and After*, 106 IOWA L. REV. 1609, 1611 (using the phrase and citing to NONOBVIOUSNESS—THE ULTIMATE CONDITION OF PATENTABILITY (John F. Witherspoon ed., 1980) and Michael Abramowicz & John F. Duffy, *The Inducement Standard of Patentability*, 120 YALE L.J. 1590, 1593 (2011) (including list of references to those using the term)).

139. An invention claim that precisely matched the elements of another invention, no more and no fewer, would fail novelty. *See, e.g.*, *In re* Schreiber, 128 F.3d 1473, 1477 (Fed. Cir. 1997) ("To anticipate a claim, a

identical, still must not be obvious from what has come before or from a combination of what has come before. The concept of obviousness embodies the notion that an inventor's creation must constitute more than routine tinkering based on existing knowledge but rather, represents the truly inventive—something that would be worthy of the government's grant of a powerful patent.[140]

At the core of many decisions about nonobviousness lies the mythical PHOSITA, an acronym that stands for "Person Having Ordinary Skill in the Art."[141] Rather than asking whether the invention would be obvious to a layperson, the court asks whether the invention would be obvious to one who knows about the relevant area of technology.[142] This does not mean the world's leading expert, but rather a person who has an ordinary level of skill in the relevant art. Thus, the term PHOSITA can be analogized to the concept of the "reasonable person" in other doctrinal realms as a generalized version of people within a particular grouping.[143]

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prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently."); *see also* 35 U.S.C. § 103 ("A patent for a claimed invention may not be obtained, . . . if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.").

140. *See, e.g.*, Robert P. Merges, *Uncertainty and the Standard of Patentability*, 7 HIGH TECH. L.J. 1, 13–14 (1993) ("Without [obviousness], anything differing only slightly from the prior art would be patentable. . . . [N]onobviousness is designed to maintain a penumbra around the stock of known devices, techniques, etc., insuring that trivial extensions from what is known will not be granted property rights."); *see also* Jeanne C. Fromer, *The Layers of Obviousness in Patent Law*, 22 HARV. J.L. & TECH. 75, 79 (2008) ("The nonobviousness doctrine seeks to ensure that patents are granted only for technologically significant advances to foster the patent system's goal of stimulating useful innovation.").

141. 35 U.S.C. section 103 provides that "[a] patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a *person having ordinary skill in the art* to which the claimed invention pertains" (emphasis added). In *KSR Int'l Co. v. Teleflex Inc.*, the Supreme Court summarized the position as follows: "When a work is available in one field, design incentives and other market forces can prompt variations of it, either in the same field or in another. If a person of ordinary skill can implement a predictable variation, . . . § 103 likely bars its patentability." 550 U.S. 398, 401 (2007); *see also* Graham v. John Deere Co., 383 U.S. 1, 17–18 (1966) ("Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.").

142. *See* Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc., 807 F.2d 955, 962 (Fed. Cir. 1986) ("The person of ordinary skill is a hypothetical person who is presumed to be aware of all the pertinent prior art.").

143. One can think of these generalized fictions as similar to the character of *Everyman* from the 15th century morality play, which is meant to teach that good deeds are the only thing a person can take on the journey to judgement at the heavenly gates. A full text of the play is available at E.P DUTTON & CO., *Everyman*, *in* EVERYMAN AND OTHER OLD RELIGIOUS PLAYS, WITH AN INTRODUCTION (Ernest Rhys ed., Project Gutenberg 2006), https://www.gutenberg.org/files/19481/19481-h/19481-h.htm (ebook).

Creating a generalized person results in a fanciful creature.[144] After all, it is difficult to imagine that any one person, even fictitious, might somehow manage to fully represent an entire group of people. Indeed, some scholars have criticized the reasonable person as problematic for its ability to be overinclusive or underinclusive, especially with respect to gender[145] and race.[146] Thus, the supposedly generalized person fails to represent all people[147] and perhaps may fail to represent any one person.

The problem is worse with PHOSITA, given that the concept reaches well beyond one individual representing a category of people. Many cases turn on prior art from different areas of technology, raising the question of whether an inventor would be sufficiently "motivated" to combine those pieces of prior art

144. *See, e.g.*, Custom Accessories, 807 F.2d at 962 (referring to the PHOSITA as a "hypothetical person"); *In re* GPAC Inc., 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing to *Custom Accessories* and its use of the PHOSITA as a hypothetical person).

145. *See, e.g.*, Mayo Moran, *The Reasonable Person: A Conceptual Biography in Comparative Perspective*, 14 LEWIS & CLARK L. REV. 1233, 1245–47 (2010) (contrasting the court's application of the reasonable person standard in *McHale v Watson* (1964) 11 CLR 384 (Austl.), which resulted in the exoneration of a 12-year-old boy who threw a dart at another child—the court stated "boys will be boys"—with the court's application of the reasonable person standard in *Mich. Cent. R.R. Co. v. Hasseneyer*, 12 N.W. 155 (Mich. 1882), which found a 13-year-old girl contributorily negligent for her own death by standing behind a reversing train, reasoning that "she would be more cautious to avoid unknown dangers[] . . . more particular to keep within the limits of absolute safety when the dangers which threatened were such as only great strength and courage could venture to encounter"); *see also* Wendy Parker, *The Reasonable Person: A Gendered Concept?*, 23 VICTORIA U. WELLINGTON L. REV. 105, 108 (1993) ("Since its inception, the reasonable man standard has been endowed with attributes that are stereotypically and exclusively male. . . . This stereotypical maleness did not seem inappropriate in the typical negligence case involving activities and situations that were overwhelmingly male. . . . The problem, however, is that the standard was never considered to be anything other than universal and women have subsequently been required to meet the same standard without any attempt being made to include a woman's perspective based on her differing experiences.").

146. *See, e.g.*, Scott Astrada & Marvin L. Astrada, *The Enduring Problem of the Race-Blind Reasonable Person*, AM. CONST. SOC'Y BLOG (May 11, 2020), https://www.acslaw.org/expertforum/the-enduring-problem-of-the-race-blind-reasonable-person (arguing, in the context of Fourth Amendment searches and seizures, that "the historical conception of a 'reasonable person' employed by the law becomes a means of perpetuating a politics of racial/ethnic exclusion of the 'Other,' i.e., a non-white racial/ethnic subject. The Other is required to comport themselves as a reasonable person that bears very little resemblance to their lived reality. This results in the 'Other' being constrained within a concept that excludes them by imposing the worldview, norms, values, etc., of a rendition of the reasonable person that is not reflective of their world"); Robert V. Ward, *Consenting to a Search and Seizure in Poor and Minority Neighborhoods: No Place for a "Reasonable Person*," 36 HOW. L.J. 239, 254 (1993) ("The objective, reasonable person test has been upheld by the Court because it believes the standard to be a method for police officers to readily understand when they are engaging in a search and seizure. Reliance is placed upon what are perceived to be objective observations. Some members of minority and poor inner city communities, however, may be so intimidated that 'consent' to a search may be granted out of fear of police retaliation.").

147. *See, e.g.*, Laura Pedraza-Fariña & Ryan Whalen, *The Ghost in the Patent System: An Empirical Study of Patent Law's Elusive "Skilled Artisan*," 108 IOWA L. REV. 247, 279–80 (2022) (explaining that the hypothetical PHOSITA has "perfect, universal access to every single piece of prior art in her own field—no matter how obscure," yet researchers do not process information this way in the real world); Daralyn J. Durie & Mark A. Lemley, *A Realistic Approach to the Obviousness of Inventions*, 50 WM. & MARY L. REV. 989, 1016–19 (2008) (advocating for a PHOSITA standard that inquires into both what the PHOSITA knows, "but also into what limits there are on that PHOSITA's knowledge" because researchers in the real world "certainly don't have access to every piece of prior art," particularly because some of this art is "secret at the time of invention"); Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1566 (Fed. Cir. 1987) (describing PHOSITA as a "ghost").

from the aggregate knowledge that exists in all of the fields together.[148] Thus, PHOSITA is an amalgam of generalized people from different categories, who are then generalized again to mesh the categories together.[149]

For example, imagine the invention of the slinky, a toy that involves a spring that can propel itself down a flight of stairs. To determine whether the invention is obvious, the patent examiner at the Patent Office or the trier of fact in court asks whether someone of ordinary skill in the art would find it obvious to go from the knowledge that exists to the new invention. Obviously, PHOSITA might have to be someone skilled in the art of toys. The prior art relevant to a slinky, however, might include knowledge from many fields, including those skilled in the art of creating: 1) mattress and upholstery springs, 2) the coils of automotive shock absorption systems, 3) the motion dynamics of devices like the Newton's cradle,[150] and perhaps others.[151] As Judge Learned Hand explained

148. See the following cases outlining Court of Appeals for the Federal Circuit's approach under which a patent claim is proved obvious if there is "some motivation or suggestion to combine the prior art teachings": Al–Site Corp. v. VSI Int'l, Inc., 174 F.3d 1308, 1323–24 (Fed. Cir. 1999); Yamanouchi Pharm. Co. v. Danbury Pharmacal, Inc., 231 F.3d 1339, 1343 (Fed. Cir. 2000) ("[T]he suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness."); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577 (Fed. Cir. 1984) ("Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination."). *See also In re* Dembiczak, 175 F.3d 994, 999 (Fed. Cir. 1999) (emphasizing the best defense against the obviousness analysis "is the rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references").

149. *See, e.g.*, Durie & Lemley, *supra* note 147, at 993 n.19.

150. The Newton's cradle "consists of a row of five smooth metal balls hanging from pairs of strings attached to a frame. . . . [W]hen the first ball is pulled aside and released, its impact with the row of balls causes one at the other end to fly off, leading to a long-lasting cycle of single balls flying off each end, with the balls in between remaining largely motionless." Robert Ehrlich, *Experiments with "Newton's Cradle,"* 34 PHYSICS TCHR. 181, 181 (1996). The invention of Newton's cradle is commonly attributed to the scientists who conducted critical research and experiments on the underlying physics behind the device—namely John Wallis, Christopher Wren, Christiaan Huygens, and Edme Mariotte—and is said to be named after Sir Isaac Newton. *See, e.g.*, Rodd Cross, *Edme Mariotte and Newton's Cradle*, 50 PHYSICS TCHR. 206, 206 (2012); Piyush Patel, *What Is Newton's Cradle and How Does It Work?*, SCI. ABC (Oct. 19, 2023), https://www.scienceabc.com/pure-sciences/what-is-newtons-cradle-and-how-does-it-work.html; Stefan Hutzler, Gary Delaney, Denis Weaire & Finn MacLeod, *Rocking Newton's Cradle*, 72 (12) AM. J. PHYSICS 1508, 1508 (2004). The Newton's cradle continues to be used across physics classrooms as a demonstration of the conservation of momentum and energy. *See, e.g.*, *Newton's Cradle*, HARV. NAT. SCIS. LECTURE DEMONSTRATIONS, https://sciencedemonstrations.fas.harvard.edu/presentations/newtons-cradle (last visited Dec. 15, 2024); *Newton's Cradle*, VA. TECH. DEP'T PHYSICS, https://www.phys.vt.edu/outreach/projects-and-demos/demonstrations-wiki/mechanics/newtons-cradle.html (last visited Dec. 15, 2024).

151. The prior art need not specifically name each component of the invention. Rather, the prior art could contain information that would lead an inventor to try a limited series of items within a single category. To offer a simple example, prior art for a new recipe could include a writing suggesting that to sweeten pastry, one should add sugar or artificial sweetener; it would not need to specify whether to add sugar, Splenda, equal, or Sweet 'n Low. If there is a "reasonable expectation of success," by testing out the various members within the category, that is enough for the prior art to cover all of the members of each category, and for a new invention to be obvious. *See In re* Merck & Co., 800 F.2d 1091, 1096–97 (Fed. Cir. 1986) (sustaining the PTO Board's rejection of plaintiff's claimed invention—a method of treating depression in humans using amitriptyline—as unpatentable due to obviousness under 35 U.S.C. § 103 because the prior art of record taught that imipramine

with great foresight in 1950, "[T]he inventor must accept the position of a mythically omniscient worker in his chosen field. As the arts proliferate with prodigious fecundity, his lot is an increasingly hard one."[152]

Regardless of whether it is the one or the many, there is no clearly accepted definition of PHOSITA in the doctrine.[153] To cap it all off, there is a humorous tug of war among practitioners about whether the acronym should be PHOSITA, POSITA, POSA, or even PSITA, although the Supreme Court has yet to opine on this weighty matter.[154]

Into this domain, strides modern AI. At the most simplistic level, AI has the ability for far more sophisticated searching and interpretation of publicly available information. Consider the types of information an AI can draw upon to find examples of prior art—examples that our hypothetical PHOSITA might be motivated to combine. Under patent law, these include U.S. patents or applications that are public; foreign patents, or applications that are public; and books or journal articles in the United States or abroad.[155] Prior art also may include sales brochures, catalogues, and manuals, as long as such materials are publicly available.[156] Finally, scholarship has noted examples of caselaw allowing even more obscure publications to serve as vehicles for demonstrating obviousness, such as "poster boards displayed at conferences, industry whitepapers, proposals circulated at working group meetings of technical standards bodies, doctoral dissertations, and postings on internet discussion forums."[157]

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was known to treat depression, and these two drugs were both psychotropic drugs and "unquestionably closely related in structure") (reasoning that the claimed invention would be obvious to the PHOSITA since there was a reasonable expectation of success that amitriptyline, like imipramine, would treat depression, reiterating that "[o]bviousness does not require absolute predictability").

152. Merit Mfg. Co. v. Hero Mfg. Co., 185 F.2d 350, 352 (2d Cir. 1950).

153. Joseph P. Meara, *Just Who Is the Person Having Ordinary Skill in the Art? Patent Law's Mysterious Personage*, 77 WASH. L. REV. 267, 290 (2002) ("Although the Federal Circuit has developed a six-factor test for defining Phosita, several factors have proven to be unnecessary or unhelpful. Others require further development before they can be properly applied. The Federal Circuit should continue to develop the Phosita factors to more accurately reflect the level of ordinary skill in the art.").

154. *See* Dennis Crouch, *Person (Having) Ordinary Skill in the Art*, PATENTLYO (Nov. 30, 2018), https://patentlyo.com/patent/2018/11/person-having-ordinary.html (describing the different terms and those who use them).

155. *See* 35 U.S.C. § 102(a)(1) (defining prior art for the purposes of novelty as "patented, described in a printed publication, or in public use, on sale, or otherwise available to the public"); 35 U.S.C. § 103 (defining an invention as obvious if the "differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains"); 2 DONALD S. CHISUM, CHISUM ON PATENTS § 5.03[3] (1980) (explaining that while "[s]ection 103 does not expressly define what sources must be looked to as 'prior art' to determine obviousness. . . . [T]he opening phrase clearly implies that the provisions of Section 102 are to be the guide." (footnote omitted)). *See also id.* at n.2 (explaining that courts rely on the section 102 novelty definition of prior art in applying the obviousness requirement of section 103).

156. Stephen Yelderman, *Prior Art in the District Court*, 95 NOTRE DAME L. REV. 837, 863 (2019).

157. *Id.* at 863–64 (including the examples cited in a category of "other" types of prior art in examining patent litigation, and noting that "[t]he accessibility of these various documents ranges somewhat (and, in some cases, might be debatable), but none of them can be described as a regularly published book or journal").

Prior to the explosion of AI in recent years, most tools were reasonably limited to searching for particular wording, and the results relied on a human's ability to guess the precise wording that might have been used. Modern AI, however, is far more sophisticated. With a little prompting, AI systems can search out precisely the suggestion one needs, not just by looking for specific words, but by searching for ideas and related words.[158]

AI also provides a more sophisticated ability to understand and combine different areas of prior art. Without AI, a competitor attempting to challenge a patent might have to develop, combine, or hire expertise in multiple areas, applying that expertise to search out motivations to combine. AI has the ability to "learn" what exists in those fields and search out motivations to combine. The AI could even be trained on the types of examples and language that prior court decisions have accepted and then use that information to search out and predict whether a court will accept one piece of prior art over another.

In addition, generative AI's ability to search the internet[159] and find relevant prior art provides a much more powerful tool for invalidating patents. In particular, some courts have an easier time crediting a written document as prior art than crediting the testimony of an expert concerning what those in the field would consider routine,[160] which makes AI's ability to find written prior art especially valuable.

As always, however, the AI is only as strong as its operator.[161] Better prompts yield better results; or, as one says in computer programming slang: GIGO (Garbage In; Garbage Out).

Modern AI systems also do much more than provide a stronger search tool. Consider whether a court should categorize AI as "having ordinary skill in the art"? After all, the concept of ordinary skill in the art is intended to test whether the inventor is trying to patent something that is merely obvious to others in the field who are creative. If AI can invent it by working through the existing body of knowledge, and humans have the ability to use AI, then the claimed invention

158. This is an affordance of the way many generative AI models that use natural language are trained, a process known as "word embedding." *See generally A Guide on Word Embeddings in NLP*, TURING, https://www.turing.com/kb/guide-on-word-embeddings-in-nlp (last visited Dec. 15, 2024) (describing word embedding).

159. This assumes that the AI system was trained on large amounts of publicly available internet data, a common practice for the most sophisticated modern generative AI systems.

160. *See, e.g.*, Millennium Pharms., Inc. v. Sandoz Inc., 862 F.3d 1356, 1361, 1364 (Fed. Cir. 2017) (after explaining that the district court's finding of obviousness relied on the testimony of Sandoz' witness that lyophilization "was well-known in the field of formulation" and "considered an obvious alternative," the Federal Circuit, nevertheless, found the patent nonobvious on the grounds that Sandoz failed to point to any "reference or combination of references that shows or suggests a reason to make the claimed compound").

161. Burk, *supra* note 28, at 309–10 (noting that as with any tool, the use of AI depends on the skill of the person setting the query and parameters).

does not require much of an inventive leap from what already exists in the body of knowledge.[162]

One could argue that including AI within those skilled in the art conflicts with the statute, given that AI is not "a *person* having ordinary skill in the art."[163] However, one can avoid the problem by conceptualizing "a person having ordinary skill in the art" as including "a person using AI as a tool."[164] Inventors use all types of tools. Why should we suddenly imagine invention as a process devoid of the latest tools?

Some scholars argue that under current law, "a creative AI system cannot be the P[H]OSITA."[165] They cite Supreme Court language in *KSR Int'l Co. v. Teleflex Inc.* that PHOSITA is "a *person* of ordinary creativity, not an automaton."[166] They also cite language from an older Federal Circuit case, *Standard Oil Co. v. Am. Cyanamid Co.*,[167] explaining that a PHOSITA "is also presumed to be one who thinks along the line of conventional wisdom in the art and is not one who undertakes to innovate."[168] Presumably, these works read the judicial language as suggesting that PHOSITA must be human. In addition, it

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162. Recall that modern AI systems encapsulate not only the large language models, but also systems trained to produce ideas from general knowledge. *See* Ryan Abbott, *I Think Therefore I Invent: Creative Computers and the Future of Patent Law*, 57 B.C. L. REV. 1079, 1083–91 (2016).

163. *See* 35 U.S.C. § 103 (emphasis added); U.S. PAT. & TRADEMARK OFF., PUBLIC VIEWS ON ARTIFICIAL INTELLIGENCE AND INTELLECTUAL PROPERTY POLICY 12–13 (2020) (citing public comments suggesting that artificial general intelligence machines "are not persons and, therefore, would not affect the legal standard of a 'person' of ordinary skill in the art") [hereinafter USPTO REPORT]; Shlomit Yanisky-Ravid & Regina Jin, *Summoning a New Artificial Intelligence Patent Model: In the Age of Crisis*, 2021 MICH. ST. L. REV. 811, 833 (2020) (citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), and italicizing the word *person* to support the notion that AI cannot be PHOSITA: "a *person* of ordinary creativity, not an automaton").

164. *See* Connor Romm, Note, *Putting the Person in PHOSITA: The Human's Obvious Role in the Artificial Intelligence Era*, 62 B.C. L. REV. 1413, 1445 (2021) ("[O]nce AI is common in a given industry, inventors will have to meet the heightened burden of showing nonobviousness based on what a PHOSITA aided by AI—as well as any other widely available technology—would find reasonably pertinent to the problem solved by the invention."); KAYE FIRTH-BUTTERFIELD & YOON CHAE, CTR. FOR FOURTH INDUS. REVOLUTION, ARTIFICIAL INTELLIGENCE COLLIDES WITH PATENT LAW 12 (2018) (mentioning, as a white paper ahead of its time, the possibility that if AI becomes more prevalent in certain industries, the definition of POSITA could be "adjusted" or "chang[ed]" to include the use of AI, but suggesting that over time, this could render all invention obvious). On the latter point, see also Lexi Heon, Comment, *Artificially Obvious but Genuinely New: How Artificial Intelligence Alters the Patent Obviousness Analysis*, 53 SETON HALL L. REV. 359, 379 (2022) ("[T]he fear of AI creating a world where everything is obvious is impending, if not already at least partially present"). *But see* Burk, *supra* note 28, at 302, 308–12 (responding to everything-is-obvious concerns by noting that patent law has proven "surprisingly adaptable," calling them magical thinking, and noting that if AI were able to invent so easily, all risk would be eliminated and there would be no need for a patent reward, anyway).

165. Yanisky-Ravid & Jin, *supra* note 163, at 834. Yanisky-Ravid and Jin use the term "creative AI" to refer to that are "capable of generating new inventions themselves." *Id.* at 817–18. Although not necessarily a term of art, this Article will use the term similarly. *See also* FIRTH-BUTTERFIELD & YOON CHAE, *supra* note 164, at 8–9 (citing the same Supreme Court and Federal Circuit case language as Yanisky-Ravid and Jin to reach a similar conclusion); *cf.* USPTO REPORT, *supra* note 163, at 13 (citing public comments suggesting that artificial general intelligence machines "are not persons and, therefore, would not affect the legal standard of a 'person' of ordinary skill in the art").

166. *See* Yanisky-Ravid & Jin, *supra* note 163, at 833 (citing *KSR*, 550 U.S. at 421 (2007) (emphasis added).

167. 774 F.2d 448, 454 (Fed. Cir. 1985).

168. *See* Yanisky-Ravid & Jin, *supra* note 163, at 833–34 (citing *Standard Oil*, 774 F.2d at 454).

would be a human who applies nothing more than "ordinary" creativity, not an "automaton" such as AI, churning away on endless iterations to search out a solution.

That interpretation, however, misses the discussion surrounding the Supreme Court's quote. In *KSR*, the Supreme Court rejected what it termed the Federal Circuit's "constricted analysis"[169] in which a PHOSITA would look only at prior art designed to solve precisely the same problem. Instead, the Justices concluded that a person of ordinary skill would think more broadly. As the Justices explained, for example: "[c]ommon sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle."[170] When the Justices conclude a few sentences later that "[a] person of ordinary skill is also a person of ordinary creativity, not an automaton," the emphasis is on "creativity," which is offered in opposition to a vision of an automaton than one who just plugs in what has gone before without thinking.[171] In other words, the Supreme Court rejects the Federal Circuit's notion that PHOSITA is merely a conventional thinker, holding instead that PHOSITA is, indeed, one who engages in creativity.[172]

At the end of the day, logic from Federal Circuit cases written decades before the Supreme Court's decision—including the older Federal Circuit case of *Standard Oil* that these scholars discuss[173]—were superseded by the *KSR* decision. A person of ordinary skill in the art is indeed one engaged in creativity.

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169. *See KSR*, 550 U.S. at 420–21 ("The second error of the Court of Appeals lay in its assumption that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem.").

170. *Id.* at 420.

171. *Id.* at 421.

172. *See, e.g.*, Romm, *supra* note 164, at 1431 (arguing that the Federal Circuit had considered PHOSITA "an unimaginative worker devoid of anything resembling creativity," but that *KSR* endowed PHOSITA with "both ordinary skill *and* creativity"); Joseph Scott Miller, *Remixing Obviousness*, 16 TEX. INTELL. PROP. L.J. 237, 249–50 (2008) ("[The] Court banished the dullard phosita of *Standard Oil*, just as the Federal Trade Commission recommended in its 2003 report and as two amici, including the United States, urged in *KSR*." (footnotes omitted)). In an earlier paper, Shlomit Yanisky Ravid and Jackie Liu interpreted *KSR* in a different manner, one that could suggest the Supreme Court had moved away from the Federal Circuit's notion of PHOSITA as one who follows conventional wisdom, rather than innovating. *See* Yanisky Ravid & Liu, *supra* note 10, at 2248 ("By far the most important development of the PHOSITA standard also came in *KSR*, with the Supreme Court transforming the PHOSITA requirement from a mere 'automaton' to a person with ordinary creativity levels."); *see also supra* notes 165–170 and accompanying text (discussing the Court's decision in *KSR*, the Federal Circuit's decision from two decades before in *Standard Oil,* and Yanisky-Ravid's analysis of the cases with a different co-author, Regina Jin). Despite these suggestions from an earlier paper, Yanisky-Ravid and Jin's later paper seems to focus on the notion of PHOSITA as conventional and ordinary, rather than applying creativity, and ignores any tension between the older Federal Circuit line of cases and *KSR. See* Yanisky-Ravid & Jin, *supra* note 163, at 833–34 ("A better way to assess the obviousness requirement may be to answer the question in the negative or to look at who cannot be a POSITA. The Supreme Court defines the POSITA as 'a *person* of ordinary creativity, not an automaton.' The Federal Circuit provides that the POSITA 'is also presumed to be one who thinks along the line of conventional wisdom in the art and is not one who undertakes to innovate.' Under these two opinions, it seems a creative AI system cannot be the POSITA." (footnotes omitted)).

173. *See supra* note 172 and accompanying text (describing Yanisky-Ravid's argument).

Nor does the Supreme Court's "automaton" language have anything to do with the extent to which AI might be involved in a PHOSITA's presumed creativity. The statutory language specifies "a person" of ordinary skill in the art,[174] and one would expect such persons to exercise their creativity by using the latest tools in the field, including AI. As one practitioner commented to the USPTO:

> Just as the existence of test tubes impacts the level of a person of ordinary skill in the chemical arts, and just as the existence of general purpose computers impacts the level of a person of ordinary skill in the software arts (and many others), so [too] would AI affect the level of skill in the arts where it can be made useful.[175]

Assuming one accepts the notion that a person of ordinary skill in the art should be conceptualized as a person using AI, one must also step back and realize the leap that generative and creative AIs provide for that PHOSITA, as well as the impact on the space for innovation.[176] AI has the potential to do even more than making it easier for challengers to search out and find relevant information by absorbing information in a more sophisticated manner, such as searching for logic rather than simply looking for identical wording. After all, a creative AI is an inventor itself. Thus, AI will be able to "see" motivation to combine logic from different arenas in a way that a humble human might not.

Thus, a PHOSITA with AI in hand will substantially raise the bar for what counts as nonobvious for all invention.[177] In doing so, the march of modern AI will increasingly shrink the possibilities for invention. Regardless of whether a human inventor is using AI or not, the entire notion of what constitutes an invention becomes increasingly difficult to satisfy.[178]

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174. *See* 35 U.S.C. § 103.

175. *See* USPTO REPORT, *supra* note 163, at 12–13 (citing practitioner Edward Ryan, and noting that many of the public comments "asserted that AI has the potential to affect the level of ordinary skill in an art").

176. This article uses the term "creative AI" to describe types of AI that can generate inventions themselves, following Yanisky-Ravid & Jin, *supra* note 163, at 817–18.

177. *Artificial Intelligence and Intellectual Property: Part III—IP Protection for AI-Assisted Inventions and Creative Works: Hearing Before the Subcomm. on Cts., Intell. Prop. & the Internet of the H. Comm. on the Judiciary*, 118th Cong. 5–6 (2024) (written testimony of Joshua Landau, Senior Counsel, Computer & Communications Industry Association) [hereinafter *AI and Intellectual Property Legislative Hearing*].

178. Some scholars have suggested that a dual-standard system should apply when AI either invents or is used as part of the invention process. *See, e.g.*, Ryan Abbott, *Everything Is Obvious*, 66 UCLA L. REV. 2, 8 (2019) (hypothesizing machines as inventors, suggesting a trajectory in which machines are eventually better at inventing than humans, and proposing that one would need different standards to evaluate patents—one for ordinarily skilled machines and one for expert machine); Yanisky-Ravid & Jin, *supra* note 163, at 834 (suggesting a two-track patent examination model "to separate the examination of AI inventions from that of human-made inventions"); Heon, *supra* note 164, at 382 (arguing that use of AI should be disclosed when a patent application is submitted and the patent should be subjected to a different obviousness standard). For a different perspective, Lucas Yordy suggests that doctrines surrounding prior art should be changed so that publicly available information about AI-generated inventions may only serve as prior art if they fully enable the public to make the invention. *See* Lucas R. Yordy, *The Library of Babel for Prior Art: Using Artificial Intelligence to Mass Produce Prior Art in Patent Law*, 74 VAND. L. REV. 521, 558 (2021).

AI alters the definition of invention by introducing a more powerful and omniscient evaluator than simply relying on the ability of a beleaguered government patent examiner or a human competitor to find and analyze the information in various fields. This will be true no matter who, or what, is responsible for carrying the ball on the invention. Even if an AI itself contributes most or all of the innovative activity, other competitors armed with AI will be able to challenge the patent on obviousness ground much more effectively than ever before.

The impact on human invention will be particularly strong. As humans expand into using AI tools, and the capacity of AI increases, the space for what the human contributes to any invention may shrink. Moreover, the ability of a solitary human to invent without the aid of such tools shrinks even more.[179] In that context, the flash of genius, which has been an essential concept in patent law, could mean less and less.

In short, AI alters the contours of inventive space. It reduces the capacity of inventions to survive scrutiny by amping up the ability to find and combine far-flung and disparate pieces of prior art. This will demonstrate the obviousness of many claimed inventions, rendering them unpatentable and shrinking the space for innovation. That shrinking capacity will increase over time as the capacity of AI systems advance. Although the impact will fall both on invention created with the help of AI and without, the space for human innovation will experience the greater contraction.

B. TRADE SECRETS

Patents and trade secrets are often presented as contrasting modes of intellectual property.[180] Quite simply, the *sine qua non* of patents is public disclosure. In the essential bargain of patent law, the patent holder receives the powerful patent right in exchange for disclosing the invention to the public and

179. *See* Mark A. Lemley, *The Myth of the Sole Inventor*, 110 MICH. L. REV. 709, 715–33 (2012) (describing the history behind some of the most pioneering modern inventions, such as the lightbulb, steam engines, telephone, and telegraph, and noting that the vast majority of the important inventions were either done simultaneously and independently by different inventors, or they resulted from a gradual and communal effort where different key components of the invention were conceived by multiple researchers working independently and almost simultaneously).

180. *See, e.g.*, Andrew A. Schwartz, *The Corporate Preference for Trade Secret*, 74 OHIO ST. L.J. 623, 627 (2013) ("Intellectual property (IP) law offers two alternative methods for protecting a novel and useful invention, patent or trade secret. . . . Both patent and trade secret offer an exclusive right over the invention, but the protection they offer differs in important ways."); W. Nicholson Price II, *Expired Patents, Trade Secrets, and Stymied Competition*, 92 NOTRE DAME L. REV. 1611, 1615 (2017) ("Trade secrets, unlike patents, can persist indefinitely; some last for many decades."); Daniel C. Munson, *The Patent-Trade Secret Decision: An Industrial Perspective*, 78 J. PAT. & TRADEMARK OFF. SOC'Y 689, 690 (1996) ("[I]nvention must concern patentable subject matter. Many valuable trade secrets do not involve patentable subject matter at all . . . ."); W. Nicholson Price II, *Regulating Secrecy*, 91 WASH. L. REV. 1769, 1776 (2016) (highlighting the legal differences between patents and trade secrecy, such as (i) disclosure of the subject matter of the claimed invention, (ii) the scope of protection, and (iii) the duration of protection).

dedicating it to public domain when the patent expires.[181] In contrast, trade secrets revolve around keeping information secret, rather than sharing with the public.

Despite this and other contrasts, the onslaught of AI is likely to disrupt trade secrets in a manner analogous to the impact on patent law. As with patents, AI alters the contours of the space for trade secrets, significantly reducing the amount of information that will emerge as protectible.

For trade secrets, the problem again lies with one of the definitional pillars of what constitutes a trade secret: What does "secret" mean, and just how secret must the information be? The federal definition provides a good example, and it mirrors the approach adopted by most of the states. In defining the term "trade secret," federal law specifies: "the information derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable through proper means by, another person who can obtain economic value from the disclosure or use of the information."[182]

In more common language, the value of the information flows from the fact that it is not generally known to those in the field and cannot be readily ascertained by proper means.[183] If a trade secret fails the test of secrecy—in other words, once the cat is out of the bag—trade secret protection is not available. In fact, under trade secret doctrines, deriving someone else's trade secret independently or reverse engineering it from what can be seen openly about the product does not constitute misappropriation of a trade secret.

The fundamental importance of secrecy and proper means of discovery can best be understood in the context of the innocent user.[184] Suppose an angry

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181. *But see* Robin Feldman, *Trade Secrets in Biologic Medicine: The Boundary with Patents*, 24 COLUM. SCI. & TECH. L. REV. 1, 26–27 (2022) (explaining that patent holders are able to file patents on biologic medicines that do not disclose how to make the invention); Sonia K. Katyal, *The Paradox of Source Code Secrecy*, 104 CORNELL L. REV. 1183, 1222 (2019) (citing Greg R. Vetter, *Are Prior Use Rights Good for Software?*, 23 TEX. INTELL. PROP. L.J. 251, 256 (2015), for the point that software patents do not disclose the code: "all that is needed is a description of the process implemented"). For an explanation of the history of patent law and how judicial decisions evolved to allow software patents to include only broad, high-level descriptions of what is accomplished, rather than the details of how the software accomplishes the task, see ROBIN FELDMAN, RETHINKING PATENT LAW 104–12 (2012) [hereinafter FELDMAN, RETHINKING].

182. 18 U.S.C. § 1839(3) (including the cited language within "the term 'trade secret' means"). The Uniform Trade Secrets Act, which has been adopted by nearly all states, defines the term "trade secret" in a similar manner as the federal statute. Uniform Trade Secrets Act § 1(4), 18 U.S.C. §§ 1831–1839 (1979) (defining "Trade Secret"); *see also* Feldman & Graves, *supra* note 20, at 79 n.53 (explaining that the language of the federal act is the same as "almost all state versions of the Uniform Act[]"). For variations in state trade secret laws, see Grant Cole, *Secrets, Sovereigns, and States: Analyzing State Government's Liability for Trade Secret Misappropriation*, 28 J. INTELL. PROP. L. 131, 143 (2021); *see also* Sid Leach, *Anything but Uniform: A State-By-State Comparison of Differences in the Uniform Trade Secrets Act*, SNELL & WILMER, L.L.P. 2 (Nov. 6, 2015), https://www.swlaw.com/assets/pdf/news/2015/11/06/How%20Uniform%20Is%20the%20Uniform%20Trade%20Secrets%20Act%20-%20by%20Sid%20Leach.pdf (discussing different versions of state trade secret laws).

183. Risch, *supra* note 108, at 6–7.

184. Richard F. Dole, Jr., *The Uniform Trade Secrets Act—Trends and Prospects*, 33 HAMLINE L. REV. 409, 425 (2010) (noting as an exception to a Uniform Trade Secrets Act misappropriation violation a "person who

worker at a company decides to release a trade secret to the entire industry by having a friend publish an article saying, "I have discovered a great, new formula, and I dedicate it to the public domain for everyone to use." Those who republish and use the information, without realizing that the information was likely acquired improperly, have no liability. By the time the company can figure out what has happened, the information already will be generally known. The company could choose to file suit against the people who released the secret, but they may have no assets for the company to pursue. As for the secret, it is too late. Once a secret is known (or readily ascertainable), it is not a secret.

Scholars have explored the impact of AI on trade secret law primarily in the following framework: the extent to which AI is likely to cause companies to lose their trade secrets if employees use AI to accomplish workplace functions and inadvertently release secrets in the process.[185] Imagine that an executive enters information from a company's strategy document into one of the new generative AI systems along with a prompt asking for slides,[186] or a junior analyst inputs company financial information requesting that the AI organize it into a spreadsheet. Now that the information has entered the AI's system, it has the potential to become future training data. Once that happens, competitors could retrieve the information by asking the AI for information on another company's strategic plans.[187]

Levine explored this problem in detail, culling examples from press reports during the first year after ChatGPT's 2022 public release.[188] Consider the following example that occurred at Samsung:

> One employee copied buggy source code from a semiconductor database into the chatbot and asked it to identify a fix[] . . . . Another employee did the same for a different piece of equipment, requesting "code optimization" from ChatGPT. After a third employee asked the AI model to summarize meeting notes, Samsung executives stepped in. The company limited each employee's prompt to ChatGPT to 1,024 bytes.[189]

The company presumably was concerned that the information could be used as training data for later iterations of the AI. Competitors might then be able to access Samsung's trade secrets by asking for sections of Samsung's code or equipment information. Imagine that the meeting the employee asked ChatGPT to summarize related to Samsung's strategic plans for the coming

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obtained subsequent knowledge or reason to know that he or she acquired knowledge of a trade secret by accident or mistake").

185. Levine, *supra* note 9, at 582–84.

186. *See* Cameron Coles, *11% of Data Employees Paste into ChatGPT Is Confidential*, CYBERHAVEN (June 18, 2023), https://www.cyberhaven.com/blog/4-2-of-workers-have-pasted-company-data-into-chatgpt (presenting this and other hypothetical examples, along with evidence suggesting actual disclosures).

187. *See id.*; Levine, *supra* note 9, at 575–80.

188. Levine, *supra* note 9, at 575–80.

189. *Id.* at 577 (citing Emily Dreibelbis Forlini, *Samsung Software Engineers Busted for Pasting Proprietary Code into ChatGPT*, PC MAG (Apr. 7, 2023), https://www.pcmag.com/news/samsung-software-engineers-busted-for-pasting-proprietary-code-into-chatgpt).

decade. If the meeting notes had found their way into training data, a query asking for Samsung's strategic plans might bear fruit.

Other scholars and commentators have suggested that a company's employees and contractors could prime the pump for generative AI systems to connect the dots on the company's trade secrets.[190] AI has an astounding ability to glean information about a company—or a person—from seemingly innocent and disparate disclosures. As Ana Nordberg explained: "[C]orrelating information from multiple sources might reveal valuable information concerning strategic market positioning decisions and ongoing research projects. . . . [as well as inferring i]nformation on pricing, client list, suppliers, distribution routes and networks, [and] manufacturing capability and processes . . . ."[191]

Trade secret law, however, faces a more fundamental challenge to its territory than either concern suggests. Imagine that every single one of a company's employees and contractors has approached AI systems with perfect competence and diligence. Not a single drop of the company's trade secret information has leaked onto the internet or into AI systems. Even in that mythical paradise, trade secret law faces a serious challenge from AI. Specifically, if AI has the ability to generate the same solution or set of information contained in a trade secret, and to do so entirely independent of any

190. *See, e.g.*, Levine, *supra* note 9, at 577–78; Ana Nordberg, *Trade Secrets, Big Data and Artificial Intelligence Innovation: A Legal Oxymoron?*, *in* THE HARMONIZATION AND PROTECTION OF TRADE SECRETS IN THE EU: AN APPRAISAL OF THE EU DIRECTIVE 192, 208–10 (Jens Schovsbo, Timo Minssen & Thomas Riis eds., 2020); *see also* Ameya Paleja, *Alpaca AI: Stanford Researchers Clone ChatGPT AI for Just $600*, INTERESTING ENG'G (Mar. 21, 2023, 6:45 AM EST), https://interestingengineering.com/innovation/stanford-researchers-clone-chatgpt-ai (giving an example of reverse engineering a generative AI product inexpensively); Joshua Weigensberg & Kate Garber, *Risks That Generative AI Poses to Trade Secret Protections*, LEGALTECH NEWS (June 9, 2023, 9:17 AM), https://www.law.com/legaltechnews/2023/06/09/risks-that-generative-ai-poses-to-trade-secret-protections/?slreturn=20240009151845 (noting that if a company employee uses third-party generative AI that allows for iterative training on prompts, that use may count against claims of trade secrets); *Trade Secrets and Generative AI: Protective Measures in an Evolving Technological Landscape*, JONES DAY (June 9, 2023), https://www.jonesday.com/en/insights/2023/06/trade-secrets-and-generative-ai (describing concern that trade secrets may accidentally end up on AI and suggesting measures to ensure against it). Other scholars have addressed concerns about the ability of AI to reverse engineer software and even other AI, rendering those areas difficult to protect by trade secret, which permits reverse engineering. *See, e.g.*, Shawn Bayern, *Reverse Engineering (by) Artificial Intelligence*, *in* RESEARCH HANDBOOK ON INTELLECTUAL PROPERTY AND ARTIFICIAL INTELLIGENCE 391, 391–96 (Ryan Abbott ed., 2022) (explaining that "[r]everse engineering is simply the process of figuring out how something works by exposure to the finished product[,]" and noting that "machine learning can dramatically reduce the costs of reverse engineering software[,]" both in terms of software in general and AI software itself); Erik Weibust & Dean A. Pelletier, *Protecting AI-Generated Inventions as Trade Secrets Requires Protecting the Generative AI as Well*, IP WATCHDOG (July 24, 2022, 12:15 PM), https://ipwatchdog.com/2022/07/24/protecting-ai-generated-inventions-trade-secrets-requires-protecting-generative-ai-well/id=150372 (raising concerns that if the AI is reverse engineered, it may not be protectible as a trade secret); *see also* Ashraf Tarek, Intellectual Property Implications of Artificial Intelligence and Ownership of AI-Generated Works 29–31 (June 28, 2023) (unpublished manuscript) (on file at https://ssrn.com/abstract=4494640) (discussing ownership of AI-generated works and noting that those may not be subject to trade secret if the AI can be reverse engineered).

191. Nordberg, *supra* note 190, at 211–12; *see also* Levine, *supra* note 9, at 578 (including a slightly expanded version of the Nordberg quote and noting that "Nordberg's analysis pre-dates ChatGPT's launch").

leakage of information from the company, the trade secret may not be protectible.

Recall that AI has the ability to iterate until it reaches a solution. As creative AI becomes more adept at generating solutions to problems, one may be able to ask the AI model to solve the problem that the trade secret holder has solved or to ask the model to generate the information that the trade secret holder has pulled together. One would not need to have detailed information about the product itself beyond a general idea of the problem to be solved.

Imagine an agency that specializes in recruiting for a particular type of position and maintains lists of possible candidates, people who are top in their fields and might be interested in switching jobs, along with the approach that might appeal to them. The agency may have spent years developing the relationships that provide the tips and insights from which the list is derived. Nevertheless, AI might be able to derive that information from culling the internet, including analyzing tone shifts in social media, as well as searching posted or reposted conversations, public writings, appearances, or even e-mail.

Or consider a company advertising that it has solved the problem of noisy leaf blowers in an inexpensive way. A creative AI, at least at some point, might be able to independently develop the solution to that problem. Therefore, a competitor, wishing to avoid the trade secret protection or prove that the product does not deserve trade secret protection, could task the AI model with developing the solution. If any person using AI as a tool can independently derive the trade secret, or a list of solutions including the trade secret, and use of that particular AI system is sufficiently widespread, the information could be deemed readily ascertainable. As such, the information would fail the definition of "secret,"[192] thereby defeating trade secret protection.

In the context of discussing patents, rather than trade secrets, Burk has pointed out that AI's power to render inventions unpatentable is limited.[193] As Burk explains, the requirement for proving an invention unpatentable rests not on whether one of ordinary skill could have easily identified any solution at all, but rather whether a PHOSITA could have easily identified *the particular solution* in the patent.[194] Translating that to the trade secret context, one might argue that to invalidate the trade secret, the AI model would have to come up with the specific trade secret as a solution, not just any solution, and that such a result is unlikely. Burk raises a reasonable consideration. How likely is it that an AI would happen to come up with that exact solution when prompted?

192. *See supra* notes 108, 182–184 and accompanying text (describing the requirements for secrecy, including that the information cannot be generally known or readily ascertainable).

193. *See* Burk, *supra* note 28, at 302, 309 (noting that patent law has proven "surprisingly adaptable," and suggesting that AI does not make everything obvious, and therefore unpatentable).

194. *See id.* at 311 ("The standard for obviousness is not now, nor has ever been gauged by the expectation that one of ordinary skill could expect to find *some* solution to the problem faced by the inventor. The standard is rather whether one of ordinary skill would as of the date of filing the application have found *the* solution the inventor found—the particularly claimed invention.").

Nevertheless, an AI could be prompted to produce an extensive list of solutions, increasing the likelihood that one of them reveals the claimed secret.

One might also ask whether evidence of one person's prompts, combined with one specific AI system, could support the claim that the information is readily ascertainable. At least at this point in the development of AI, the skill of the driver determines the performance of the vehicle.[195] In other words, is the information readily ascertainable just because one person operating the AI and crafting the prompts managed to reach that particular information via the AI?

Framing the question in that manner suggests two possible challenges to the claim that the information is readily ascertainable. As a backdrop to both of these concerns, the phrase is "readily" ascertainable. Under trade secret law, the fact that a single competitor independently came up with the trade secret does not render the information either generally known or readily ascertainable.[196] Thus, evidence that one person reached the secret using AI could suggest that the information may be ascertainable, but not "readily."

For example, if I could discover the secret by going to the library (or typing a simple question into a search engine), the information would be readily ascertainable. However, if I could only discover the information on an island in the middle of the ocean in the paper archives of a small community that guards the archives against outsiders, the information might be ascertainable, but not readily.

Along similar lines, one might be able to argue that the person operating the AI is particularly talented. But the fact that one genius could derive the secret might not necessarily lead to the conclusion that the information is "readily" ascertainable.[197] To bring an analogy from patent law into the trade secret

195. *Cf. id.* at 309–10 (noting in the context of patent law that "machine learning systems find only what humans design them to find, within statistical parameters that humans must specify" and "[i]ndeed, AI outputs are so copious and non-discriminating that humans must specify which algorithmic outcomes are sufficiently 'interesting' to merit inclusion in the pool of viable results"); E-mail from George W. Jordan III, Chair, ABA Section of Intell. Prop. L., to WIPO Secretariat, World Intell. Prop. Org. (Feb. 12, 2020) (on file at World Intell. Prop. Org. website) ("[T]he elements of an AI invention will be some combination of features that underlie, engender, and/or utilize the *human-simulation aspects* of the AI invention." (emphasis added)).

196. *See, e.g.*, AvidAir Helicopter Supply, Inc. v. Rolls-Royce Corp., 663 F.3d 966, 973 (8th Cir. 2011) (upholding the district court's finding that AvidAir misappropriated Rolls-Royce's trade secrets, specifically details about its overhaul procedure for the Model 250 engine, because "[t]he fact that information can be ultimately discerned by others—whether through independent investigation, accidental discovery, or reverse engineering—does not make it unprotectable. . . . Instead, the court must look at whether the duplication of the information would require a substantial investment of time, effort, and energy."); *see also* MicroStrategy Inc. v. Bus. Objects, S.A., 331 F. Supp. 2d 396, 417 (E.D. Va. 2004) (noting that whether a trade secret is readily ascertainable is "heavily fact-dependent and simply boils down to assessing the *ease* with which a trade secret could have been independently discovered" (emphasis added)); Liberty Am. Ins. Group, Inc. v. WestPoint Underwriters, L.L.C., 199 F. Supp. 2d 1271, 1287 (M.D. Fla. 2001) (concluding that the plaintiff's park list and park data, which consisted of publicly-available information that could observed by any visitor to the parks, were not trade secrets because the defendant compiled their own list in two days from the same information).

197. *Cf. AvidAir*, 663 F.3d at 973 ("[T]he fact that information can be ultimately discerned by others—whether through independent investigation, accidental discovery, or reverse engineering—does not make it unprotectable. . . . Instead, the court must look at whether the duplication of the information would require a substantial investment of time, effort, and energy.").

context, just as the law looks to a person of ordinary creativity—not one at the top of the field—to determine if the claimed invention is not enough of a leap beyond what those in the field know, so too does trade secret law consider ascertainability generally for those in the industry. That analogy, once again, highlights concepts at the heart of determining what is worthy of protection: In both cases, the measuring stick uses as a comparator those who have a level of knowledge within the relevant fields—not the genius or the outlier.

All of these considerations, however, are premised on the notion that the AI's output is heavily dependent on the skill of the user and the AI product. That is certainly the current state of the art, but AI technology continues to move in leaps and bounds. As AI improves, its capacity to operate with lower levels of human skill may also improve as well. Over time, the likelihood that different users and different AI models will reach a reasonably similar set of options as results will increase, intensifying the problem of AI's ability to independently generate what is now a trade secret. As AI continues to expand its development, the amount of information that can be protected as a trade secret will continue to contract.

In addition, from the perspective of the human contribution to trade secrets, the ability of humans to develop information by carefully amassing it through contacts, skill, and experience—in a way that AI cannot replicate or surpass—may decline. As a result, the impact on human contribution to trade secrets may be particularly large.

In short, as with patents, AI will significantly shrink the pool of what is worthy of protection, carving off a large section of currently protected trade secrets that will no longer withstand a challenge. That impact may fall most heavily on the human contribution to trade secrets.

IV. SHRINKING THE VALUE PROPOSITION

The global economy is sustained by a simple myth: the notion that the paper or coins in your pocket actually have value.[198] It is only our collective belief in the value of money that grants it the coveted crown of both "the root of all evil" and the driving force that makes the world go round.[199] However, if humans simply stopped believing money has value, the global economy would collapse.

198. As explained by Milton Friedman, who was awarded the Nobel Prize for Economics in 1976:

> [P]rivate persons accept [money] because they are confident that others will. The pieces of green paper have value because everybody thinks they have value. Everybody thinks they have value because in everybody's experience they have value . . . . The United States could barely operate without a common and widely accepted medium of exchange . . . ; yet the existence of a common and widely accepted medium of exchange rests on a convention: our whole monetary system owes its existence to the mutual acceptance of what, from one point of view, is no more than a fiction.

MILTON FRIEDMAN, MONEY MISCHIEF: EPISODES IN MONETARY HISTORY 10 (1994).

199. 1 *Timothy* 6:10 (King James) (quoting St. Paul); CABARET (ABC Pictures Corp. 1972). As the country western song notes, "money can't buy everything. Well that may be so. But it could buy me a boat." CHRIS JANSON, *Buy Me a Boat*, *on* BUY ME A BOAT (Warner Bros. Nashville 2015).

As the myth of the almighty dollar disintegrates,[200] we would merely see shreds of paper and shiny discs.

Mythmaking provides the contours of the problem faced by copyright and trademark. As with all intangibles, the value rests on the shared conviction that they exist and that we know what they are. And, of course, we have to believe that whatever they are, they have value. To the extent AI alters the public's confidence that the shared conviction is accurate, the myth begins to dissolve. And to the extent AI decreases the public's perception of the commercial worth of the intangible, the value proposition suffers further. At base, therefore, AI threatens to profoundly undermine the value of these disembodied rights. The importance of shared conviction in the context of the legal system can be understood in the following manner. To communicate effectively, all societies need a certain level of commitment to those things that we believe exist and a basic concept of what they are.[201] The need for a shared commitment operates whether we are talking about something abstract or something concrete. For example, do we believe truth exists; do we believe wood exists?[202]

These shared understandings help human beings grasp and categorize the world around us, not to mention provide the ability to communicate with one another. For example, if John believes sidewalks are infinitely expandable, he

200. Such fictions are commonplace in the law where fictions are created as tools to conceptualize elusive and intangible things. *See, e.g.*, Christopher K. Odinet, *Data and the Social Obligation Norm of Property*, 29 CORNELL J.L. & PUB. POL'Y 643, 643, 660 (2020) (discussing a trend in the Supreme Court "toward a more robust conception of data as property" and how in *South Dakota v. Wayfair*, 585 U.S. 162 (2018), a tax case concerning the taxability of online retailers with no physical presence in the State of South Dakota, the "Court felt the need to express a view that data's intangible nature can still be conceptualized as tangible under the law"); *see also* Martin Petrin, *Reconceptualizing the Theory of the Firm—From Nature to Function*, 118 DICK. L. REV. 1, 9 (2013) (discussing the historical legal theories of conceptualizing the firm by fiction, aggregate, and reality theories and arguing for a conceptualization based on the function of the firm rather than by its nature); Oliver R. Mitchell, *The Fictions of the Law: Have They Proved Useful or Detrimental to Its Growth?*, 7 HARV. L. REV. 249, 264–65 (1893) ("[I]t seems clear that the common law is much indebted to fictions, considered as a whole, for its rapid development and ability to follow closely the wants of men. . . . The last vestige of the fictitious principle will die out when the need to resort to it has ceased. When in the fulness of time the law has achieved its full stature; when every great principle has been not merely dotted out, but firmly outlined; when what is apparently conflicting has been harmonized, and what is left to do is but a process of amplification and refining,—fictions and the fictious principle itself will cease to be used, because they will have ceased to be useful."); *cf.* Dan L. Burk, *Cheap Creativity and What It Will Do*, 57 GA. L. REV. 1669, 1690–91 (2023) (in the context of arguing that AI will increase the interest in authentic works, explaining that authenticity is "not a natural or native characteristic in any circumstance, but arises out of human interaction, imagination, and performance in every circumstance," and "[m]ost importantly, it is not an inherent property of any object or occurrence, but arises from a confluence of social perception and cultural practices").

201. *See, e.g.*, FELDMAN, RETHINKING, *supra* note 181, at 13–15 (discussing the philosophical roots of this concept in the context of intellectual property); JEROME S. BRUNER, JACQUELINE J. GOODNOW & GEORGE A. AUSTIN, A STUDY OF THINKING 12–13 (Routledge 2d ed. 2017) (1986) (explaining the various achievements of categorizing, which is "essential to life" because it helps to identify events "as *sure* as possible as *early* as possible"); Ronald de Sousa, *The Natural Shiftiness of Natural Kinds*, 14 CANADIAN J. PHIL. 561, 562 (1984) (describing "natural kinds" philosophy, which is concerned with categorization based on natural properties).

202. *See* FELDMAN, RETHINKING, *supra* note 181, at 14 (comparing belief in the concept of a divine and belief in the existence of water).

may have difficulty explaining to a police officer—who believes in the finite nature of objects—why he tried to drive his car on the sidewalk.

Put another way, language, with its uncertainties and indeterminacies, is not always a reliable guide.[203] Try coming up with a definition of the word "sandwich." The definition might not be able to exclude other items, such as a calzone or a hot dog, and might not be able to include an open-faced sandwich. Nevertheless, cultural experience and context can often endow a word with a shared understanding. For example, if a colleague says, "I'm going out to get a sandwich. Would you like one?," most people don't expect to receive a hot dog.

In gratitude for supplying this example, I thank Benjamin Zagorsky, a tech CEO who has used the sandwich hypothetical to test computer programming applicants. It is a wonderful test that can reveal a candidate's ability to categorize, as well as the candidate's temperament when faced with a Kobayashi Maru—that is, a training exercise at which one cannot succeed.[204]

None of the discussion above is meant to suggest that our common understandings are free of uncertainty or that they are static. Language evolves as do our experiences and cultural conversations.[205] Nor is the law any stranger to the indeterminacy of language. Those who must draft and interpret contracts, not to mention caselaw and legislation, are intimately familiar with the difficulties of assigning meaning to words, particularly untethered from their context.[206] Moreover, as this author has described in prior work, legal doctrine evolves as lawyers seek out the interstices, that is, the open spaces between the

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203. *See id.* at 15–18 (discussing the limitations of language); *see, e.g.*, F. MAX MÜLLER, LAST ESSAYS 54 (Longman, Green & Co. 1901) (expounding on the notion that "[N]othing is more certain than that two people hardly ever take the same word in the same sense"); JACQUES DERRIDA, OF GRAMMATOLOGY 1, 6 (Gayatri Chakravorty Spivak trans., John Hopkins Univ. Press 1st ed. 1976) ("[L]anguage itself is menaced in its very life, helpless, adrift in the threat of limitlessness, brought back to its own finitude at the very moment when its limits seem to disappear, when it ceases to be self-assured, contained, and *guaranteed* by the infinite signified which seemed to exceed it."); ALFRED SIDGWICK, ELEMENTARY LOGIC 192–94 (1914) (arguing that as a tool for reasoning, the "fundamental defect of language is its necessary indefiniteness . . . indefiniteness belongs to all *description*—to every word when and while its function is to describe"); Rex A. Collings, Jr., *Unconstitutional Uncertainty—An Appraisal*, 40 CORNELL L.Q. 195, 195 (1955) ("There is no sharp line between language which is uncertain and language which is certain. What is uncertain at one time may be certain at another."); *cf.* ROBIN FELDMAN, THE ROLE OF SCIENCE IN LAW 183 (2009) (in the context of describing the benefits and limitations of mandating plain-language patents, noting that "[l]anguage will always be subject to varying interpretations, no matter how clear and plain one tries to make it") [hereinafter FELDMAN, ROLE OF SCIENCE IN LAW].

204. *See* STAR TREK II: THE WRATH OF KHAN (Paramount Pictures 1982) (showing Kobayashi Maru as the fictional test that cadets must face at Starfleet Academy).

205. *Cf.* Lawrence Lessig, *Fidelity and Constraint*, 65 FORDHAM L. REV. 1365, 1373 (1997) (arguing one must reconstruct the original constitutional context surrounding a meaning in order to clarify that original meaning); Robert J. Pushaw, Jr., *Talking Textualism, Practicing Pragmatism: Rethinking the Supreme Court's Approach to Statutory Interpretation*, 51 GA. L. REV. 121, 133–78 (2016) (outlining constitutional statutory interpretive approaches).

206. *See, e.g.*, Richard Craswell, *Do Trade Customs Exist?*, *in* THE JURISPRUDENTIAL FOUNDATIONS OF CORPORATE AND COMMERCIAL LAW 118, 132–33 (Jody S. Kraus & Steven D. Walt eds., 2000) (describing the difficulty of fixing meaning with legal rules); Alan Schwartz & Robert E. Scott, *Contract Theory and the Limits of Contract Law*, 113 YALE L.J. 541, 570–73 (2003) (expounding on the challenges of linguistic interpretation in contract law); *cf. In re* Bridgeford, 357 F.2d 679, 682 (C.C.P.A. 1966) ("[T]he right to a patent on an invention is not to be denied because of the limitations of the English language[] . . . .").

interpretations of language, in which a new approach might be offered.[207] Nevertheless, for example, "[o]ur attempts to define bears . . . will be fundamentally different from an attempt to define[] . . . dark matter, something that may or may not exist but about which we have some clues[,] . . . [even if we] argue about the definition of bears at the margin."[208] The following Part explores the evolution of shared meaning as it applies to copyright and trademark.

A. COPYRIGHT

AI in general, and generative AI in particular, threatens to undermine our confidence that we have a shared understanding of the material subject to copyright. If we look at any individual work that is potentially protectible, what is it? Is it created entirely by the author, entirely by an AI, or as a combination of work by both? And if the work reflects writing from both, to what extent did each contribute? If an AI is involved in some manner, what sources have contributed to the AI's work; how reliable are those sources; how accurate is the information contained? Thus, for most people, understanding copyrighted work in an era of AI is closer to understanding dark matter than bears.

The uncertainty is exacerbated by the current concerns related to misinformation and disinformation, with misinformation meaning simply that the information is in error and *dis*information meaning the information is designed to mislead.[209] Misinformation is particularly concerning given fears of sophisticated state-sponsored efforts to shift public views and understanding through manipulating information on the internet and social media.[210] If we cannot know the sources used in creating a copyrighted work, and we cannot trust the accuracy of sources in general, how can we value the copyrighted work?

Some of the uncertainty regarding influences—and the extent of the contributions of those influences—has bubbled under the surface of copyright long before AI appeared on the scene. Authors and artists are influenced by works around them all the time, both consciously and subconsciously. Any item around can serve as a muse, as long as the inspired work does not come too close to the inspiration.[211] To some extent, AI has a greater capacity to learn how to

207. *See* FELDMAN, ROLE OF SCIENCE IN LAW, *supra* note 203, at 3–4, 81 (exploring the nature of law and arguing that "[t]hose wishing to escape the constraints of any doctrinal structure will seek the open spaces, the interstices among those things that have been decided," and thus "legal issues are constantly new because the law itself drives both behavior and legal argument into new areas").

208. FELDMAN, RETHINKING, *supra* note 181, at 14.

209. *See* NATIONAL SECURITY COMMISSION ON ARTIFICIAL INTELLIGENCE, NATIONAL SECURITY COMMISSION ON ARTIFICIAL INTELLIGENCE FINAL REPORT 287 n.1 (2021).

210. *Id.* at 46 (highlighting concerns that adversaries may use AI-powered misinformation to "create systems to manipulate citizens' beliefs and behavior").

211. Arnstein v. Porter, 154 F.2d 464, 470–71 (2d Cir. 1946) (denying dismissal on summary judgment regarding whether Cole Porter copied the song "Begin the Beguine" from a prior author's song, "My Heart Belongs to Daddy"); Bright Tunes Music Corp. v. Harrisongs Music, Ltd., 420 F. Supp. 177, 180–81 (S.D.N.Y. 1976) (holding defendant liable for copyright infringement due to unconscious copying).

approach the legal line without stepping over. Wherever legal lines are drawn, AI could be programmed to ensure that the words, style, or tone adapted into a work stops short of the legally recognized line of copyright infringement. Of course, human creators could do that now. Any writer or artist could hire an army of attorneys to check the work for potentially infringing uses of any work to which the artist may have been exposed. That inquiry would be prohibitively expensive, not to mention extraordinarily difficult to accomplish. In contrast, AI may be able to accomplish more than that with the push of a button.

Some of these concerns potentially could be mitigated as technology evolves. Perhaps generative AI will develop so that sources can be tagged and traced—or at least verified to be authentic. Theoretically, AI could develop so that it could spit out a footprint of the path it traveled, which could be accessed for anyone who cared. Although theoretically possible, such a solution might sufficiently hamper an AI or its users to the point that it would be impractical. Worse yet, it might simply be ignored, making the value of such an exercise useless.[212]

A similar problem plagues the various proposals to strengthen confidence in AI through disclosure.[213] Such proposals suggest that authors should provide notice when AI has been used. One can already see examples of press articles providing notice that the work was drafted by AI.[214] With disclosure requirements, companies may be tempted to created uninformative, blanket disclosures. For example, companies could choose to say, "this article may have been researched or drafted by or with the assistance of AI."

Blanket disclosures can become useless, if sufficiently widespread. Consider the Proposition 65 warnings in California. Enacted in 1986, Proposition 65 requires that businesses "provide a clear and reasonable warning before knowingly and intentionally exposing anyone to chemicals that are known to the state to cause cancer or birth defects or other reproductive harm."[215] The result is that most office buildings, residential apartment buildings, and other commercial locations contain a Proposition 65 notice

212. *See infra* notes 215–216 and accompanying text (discussing ubiquitous warnings that are ignored).

213. *See, e.g.*, Copyright Registration Guidance: Works Containing Materials Generated by Artificial Intelligence, 88 Fed. Reg. 16, 190 (Mar. 16, 2023) (codified at 37 C.F.R. § 202) (requiring, as Copyright Office guidance, authors seeking copyright protection to disclose the inclusion of AI-generated content and provide explanation of human author's contributions to the work); H.R. 3831, 118th Cong. (2023) ("Generative artificial intelligence shall include on any output generated by such artificial intelligence the following: 'Disclaimer: this output has been generated by artificial intelligence.'"); Tabrez Y. Ebrahim, *Artificial Intelligence Inventions & Patent Disclosure*, 125 PENN ST. L. REV. 147, 205 (2020) ("Congress should enact reforms to the patent system to require greater disclosure of AI-generated output of inventions that were hardly (or never) developed or were effectively concealed through an unexplainable algorithmic inventive process.").

214. *E.g.*, Katie Notopoulos, *A Tech News Site Has Been Using AI to Write Articles, So We Did the Same Thing Here*, BUZZFEED NEWS (Jan. 12, 2023, 6:05 PM), https://www.buzzfeednews.com/article/katienotopoulos/cnet-articles-written-by-ai-chatgpt-article (describing CNET's use of the following disclaimer: "[t]his article was generated using automation technology and thoroughly edited and fact-checked by an editor on our editorial staff").

215. CAL. HEALTH & SAFETY CODE § 25249.14 (West 2018).

warning that the premises may contain these chemicals. One could hardly survive, however, without entering a single office, residential, or commercial building. At the end of the day, there is no evidence that California citizens pay any attention to these warnings.[216] Even when disclosures are more definite and explicit, consumers pay little attention when they are ubiquitous. Ask any person who has ever bought a pack of cigarettes whether they paid attention to the package warnings.

As any economist will attest, uncertainty undermines value. Just watch the stock market react to uncertainty in the economic climate, in general, or the stability of an individual company, in particular. Similarly, as AI brings many forms of uncertainty about the provenance and reliability of all copyrighted work,[217] it undermines the value of the copyright system as a whole.

In addition to concerns about source in relation to the copyrighted work, a more insidious threat looms that could weaken the value of the copyright system. Generative AI may make content generation quicker and easier for some writers and artists, but it is not necessarily improving the quality of the output. At least at this time, the writing content that AI assists and produces is often more banal and less insightful than the product a decent writer can produce.

The tendency to produce mediocrity may change over time, as AI becomes more skilled. Nevertheless, computers have always been better at tasks that do not require the more subtle human qualities of intuition and judgment.[218] The same may also prove true for artistic and linguistic creativity, as well as novel analysis of thought.

Of course, there are many mediocre writers out there, as well. However, the greater the volume of mediocre content that is produced, the more the average level of quality across the copyright system diminishes. When everything becomes mediocre, that, too, can undermine the value proposition of copyright. If society is creating the potential to earn a reward for something that is, on average, of lower quality, the value of the entire exercise is reduced. It

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216. *See, e.g.*, Clifford Rechtschaffen, *The Warning Game: Evaluating Warnings Under California's Proposition 65*, 23 ECOLOGY L.Q. 303, 340 (1996) ("Many warnings go unnoticed, fail to inform the public adequately about its exposure to listed chemicals, and fail to communicate effectively the risk levels involved."); Geoffrey Mohan, *You've Seen the Warning. But Does Prop 65 Actually Keep You Safe?*, L.A. TIMES (July 23, 2020, 6:00 AM PT), https://www.latimes.com/business/story/2020-07-23/prop-65-product-warnings (highlighting the results of an investigation that revealed that California consumers are "overwarned, underinformed and potentially unprotected" by the abundance of Proposition 65 warnings and that most Proposition 65 enforcement is driven by "a handful of attorneys and their repeat clients").

217. *See supra* notes 209–212 and accompanying text.

218. *See, e.g.*, Lance Whitney, *Are Computers Already Smarter Than Humans?*, TIME (Sept. 29, 2017, 10:09 AM EDT), https://time.com/4960778/computers-smarter-than-humans/ (highlighting several advantages that computers have over humans, such as better memories, faster processing speed, and not burdened by physical constraints such as tiredness); David De Cremer & Garry Kasparov, *AI Should Augment Human Intelligence, Not Replace It*, HARV. BUS. REV. (Mar. 18, 2021), https://hbr.org/2021/03/ai-should-augment-human-intelligence-not-replace-it (noting that AI is useful in organizational settings because it can quickly identify informational patterns but explaining that human intelligence possesses the ability to "imagine, anticipate, feel, and judge changing situations").

raises questions concerning what we are rewarding, as a society, and whether the measure of the potential reward still correlates with the value received.

In short, the threats AI brings to the copyright system reach far beyond the uncertainty of whether using generative AI constitutes copyright infringement, whether works generated by AI will receive copyright protection, or whether copyrighted works will become less protectible due to generative AI—although these factors could undermine the value of copyrights. Rather, the problem looming on the horizon operates at a deeper level. How can one have confidence in the value of work covered by copyright if one cannot determine the extent to which the work is a product of someone or something other than the human author? On a more fundamental level, how can one have confidence that the copyright system itself has value?

B. TRADEMARK

Under the modern conception, as described in Part II.C., the trademark regime operates to reduce consumer search costs by allowing consumers to rely on the positive reputation of trademark holders they trust. AI threatens to undermine our confidence, both in the source of the product and that we understand the product's quality.

As a starting point, AI can undermine confidence that we have a shared understanding of the product associated with a producer's trademark. One cannot determine whether the product process involves only the trademark holder, partial use of an AI, or is entirely produced by an AI. Nor can one easily determine the reliability of the AI or whether the trademark holder or the AI deserves the reputation associated with the trademark.

Of course, one could just conceptualize a trademark holder as having used AI as a tool and the reputation of the trademark holder as resting on its ability to evaluate the tool.[219] But with the complexity of AI, it may be unclear how much any individual or organization can understand and evaluate what the AI has done and how good it is.[220] We may lack faith that a trademark holder is able to properly judge the quality of the output of the AI tools used.[221] In addition, with

219. *See* Yanisky-Ravid & Jin, *supra* note 163, at 848 (discussing an argument that the definition of PHOSITA should be expanded to include "a person using an *ordinary* AI tool"); Katyal & Kesari, *supra* note 92, at 508–11 (explaining Stigler's 1961 framing of advertising as reducing consumer search costs and the theory's subsequent migration to trademark theory).

220. One could argue that, given that AI is capable of testing, evaluating, learning, and adjusting more rapidly than a human can understand and follow, even those inside the organization that created the AI cannot fully understand what the AI has done and how good the result is. *See* Noam Hassenfeld, *Even the Scientists who Build AI Can't Tell You How It Works*, Vox (July 15, 2023), https://www.vox.com/unexplainable/2023/7/15/23793840/chat-gpt-ai-science-mystery-unexplainable-podcast.

221. *Supra* note 220 and accompanying text. *Contra* Henry Du, *Can AI Tame the Metaverse's Wild West?*, 15 LANDSLIDE 14, 15, 17 (2023) (listing recent developments in using AI to protect trademarks and arguing that AI is "increasingly proving to be a valuable tool globally for protecting brand owners, including the surveillance to detect trademark infringement and to fight bad faith trademark registrations"); Ani Khachatryan, *The Digital*

the increasing ease of use of AI, it may be irresistible for individuals and entities to adopt the use of AI faster than they can understand and police its quality.[222]

The lack of confidence regarding what a trademark represents is exacerbated by concerns about disinformation and misinformation, although the concerns may not take the same form as with copyright.[223] Unlike copyright, state-sponsored efforts to shift public opinion may create less of a concern for the reliability of a trademarked product. Nevertheless, a state could conceivably try to influence the opinion of buyers, shifting purchases to a state-controlled producer or the country's industry, in general. For example, one could imagine a nation with producers of generic medicines trying to create fears that producers of generic medicines in another country suffer from quality control problems.

Regardless of the likelihood of state-sponsored efforts, the lack of a shared understanding in the trademark realm is exacerbated by misinformation and disinformation problems. In particular, AI's ability to obfuscate and misdirect the consumer's perception of the source, and the quality of that source, raises concerns for a regime designed specifically to protect source information. For example, retail giants like Amazon, along with brand-name producers, are plagued by problems related to diversion of sales from brands to counterfeit or subpar products by those who pose as the trademarked seller or a third-party selling the trademarked product.[224]

Dilemma: Counterfeit Culture and Brand Protection Reform in the E-Commerce Era, 43 LOY. L.A. ENT. L. REV. 247, 284 (2023) (listing examples of AI companies whose products aim at detecting trademark infringement); Daryl Lim, *Trademark Confusion Simplified: A New Framework for Multifactor Test*, 37 BERKELEY TECH. L.J. 867, 871, 927, 930, 932 (2022) (suggesting positive roles AI can play in trademark law, including for predictive trademark classification, robot adjudication, and weighing likelihood-of-confusion factors); Anke Moerland & Conrado Freitas, *Artificial Intelligence and Trademark Assessment*, *in* ARTIFICIAL INTELLIGENCE AND INTELLECTUAL PROPERTY 266, 267, 278, 291 (Jyh-An Lee, Reto Hilty & Kung-Chung Liu eds., 2021) (empirically testing AI tools for trademark infringement detection and predicting that complex or substantive tasks will remain in human hands with administrative tasks like registration, examination, opposition, and judicial procedures are, and will increasingly, fall to an AI).

222. The problem may be less acute than with copyright, although trademark protection can go hand in hand with copyright protection. In addition, some authors have claimed overlapping copyright protection for works. For example, the Walt Disney Company holds a trademark for Mickey Mouse. MICKEY MOUSE, Registration No. 0247156. *See also* Robin C. Feldman, *Copyright at the Bedside: Should We Stop the Spread?*, 16 STAN. TECH. L. REV. 623, 625 (2013) (discussing authors of the Mini Mental State Exam (MMSE), a ubiquitous set of questions evaluating a patient's mental state for the purposes of research or treatment, claiming both copyright and trade secret protection and questioning the validity of those claims).

223. *See supra* notes 209–210 and accompanying text (discussing exacerbations caused by concerns over the reliability of training data given misinformation and disinformation on the internet).

224. For example, a consumer might search Amazon for "Lululemon yoga pants" and find that the first item shown looks like the Lululemon product but is actually a cheap unknown brand. Finding the Lululemon brand requires scrolling down past all of the sponsored junk brands. *See* Sarah Berry, *What Is Amazon Listing Hijacking? (And How to Protect Your Listings)*, WEBFX (Mar. 13, 2023), https://www.webfx.com/blog/marketing/amazon-listing-hijacking/ (describing listing hijacking as a third-party seller offering "a counterfeit version of [an original seller's] product on [the original seller's] listing, which can decrease . . . sales and number of positive reviews" because consumers believe the counterfeit version is the original seller's product); *Listing Hijacked! What to Do, and How to Do It?*, SELLER SNAP (Feb. 23, 2023), https://www.sellersnap.io/amazon-listing-highjack (explaining the financial and reputational detriment caused

Trust problems also flow from fake positive reviews and from the phenomenon of influencers and evaluators, who may appear neutral but are paid by producers and have an interest in declaring the product a "must have" or "one of the top-ten."[225] Although paid evaluators and fake reviews existed before AI, AI has the potential to amplify the impact of these practices by vastly improving the ability to target messages to susceptible buyers and identify types of brands more vulnerable to the practices and the most effective pathways. Along these lines, Garon suggests that sophisticated bots and massive disinformation campaigns could "cybersquat on the training data."[226] Thus, a competitor could register a mark inappropriately (for example, registering Mercedes.com when you are not the automotive company, Mercedes-Benz) or use a mark that approximates the mark used by the trademark holder. Bots could then inflate the number of clicks on the fraudulent mark's product or use strategies that induce people to write bad reviews of the branded product, leading the AI to make inaccurate recommendations.[227]To state it broadly, AI helps create a better thief. This result makes sense. One could not reasonably expect AI to enhance efficiency and effectiveness only for those who wish to do good.

As with copyright, the advent of AI may make it easier for competitors to come achingly close to the line of trademark infringement without stepping over it. One could potentially program an AI to analyze case decisions on infringement and design a trademark that comes close to a competitor's mark but has a low risk of constituting infringement.

Beyond confusion over the value and identity of a mark, the value of the field of trademarks as a whole may be vulnerable to downward pressures. Confusion in the market may lead consumers to pay less attention to trademarks

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by hijackers who "target popular products in order to reproduce cheaper knockoffs, disguising them as originals"); *see also* Jeff Bercovici, *Amazon's Counterfeit Crackdown: What It Really Means*, INC. (Feb. 28, 2019), https://www.inc.com/jeff-bercovici/amazon-project-zero.html (explaining that hijacking involves scammers flagging legitimate sellers as offering counterfeit or defective goods in order to get their privileges to their valuable product listings); Andrea B. Taylor, *10 Worst Things to Buy on Amazon*, KIPLINGER (Sept. 26, 2024), https://www.kiplinger.com/slideshow/spending/t062-s001-worst-things-to-buy-on-amazon-com/index.html; *cf.* Alexandra Berzon, Shane Shifflett & Justin Scheck, *Amazon Has Ceded Control of Its Site. The Result: Thousands of Banned, Unsafe or Mislabeled Products*, WALL ST. J. (Aug. 23, 2019, 8:56 AM ET), https://www.wsj.com/articles/amazon-has-ceded-control-of-its-site-the-result-thousands-of-banned-unsafe-or-mislabeled-products-11566564990 (identifying counterfeit products as potentially containing dangerous materials or lacking proper warning labels); *see also* Daniel Seng, *Detecting and Prosecuting IP Infringement with AI: Can the AI Genie Repulse the Forty Counterfeit Thieves of Alibaba?*, *in* ARTIFICIAL INTELLIGENCE AND INTELLECTUAL PROPERTY, *supra* note 221, at 292, 310 (noting that automated trademark infringement detection algorithms "can only *approximate* the probability that a seller or a listing is counterfeit").

225. *See* ADVERT. STANDARDS AUTH., INFLUENCER AD DISCLOSURE ON SOCIAL MEDIA 1,5 (2021), https://www.asa.org.uk/static/dd740667-6fe0-4fa7-80de3e4598417912/Influencer-Monitoring-Report-March2021.pdf (studying over 24,000 Instagram "Stories" from popular UK-based influencers and reporting that 5,732 of those stories were ads and that over 60% of ads failed to meet the necessary disclosure requirements, as stipulated by the Advertising Standards Authority).

226. Jon M. Garon, A Practical Introduction to Generative AI, Synthetic Media, and the Messages Found in the Latest Medium 44 (Mar. 20, 2023) (unpublished manuscript) (on file at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4388437).

227. *Id.*

or to disregard them entirely. For example, Seng et al. suggest that the reputation of an online platform, such as Amazon, and the platform's rating system "have largely replaced the traditional forms of trust from dealings with physical platforms and known traders."[228] Similarly, Garon notes concerns that AI-generated product recommendations are interfering with the role of trademark and brand management and that AI will replace the role of trademarks as identifying sources of goods and services.[229] These shifts would undermine the entire value of trademarks. Finally, as Grynberg explains, given that AI can inexpensively gather a wealth of information in a heartbeat, it may analyze quality more in-depth than the "comparatively simple signals embodied in brand names."[230] That level of analysis would require an enormous investment of time if one tried to obtain it by hand.[231]

Finally, trademark faces the threat of a descent into mediocracy, similar to the threat faced by copyright.[232] AI already offers the promise of quickly and inexpensively creating trade names and marks. However, conversations with industry insiders suggest that the secret sauce of a wildly successful trademark flows from human instinct in a way that AI cannot replicate. To the extent their assessment is valid, the AI-invented trademarks may have a lower level of quality and effectiveness, reducing the overall quality of the field. As with copyright, therefore, AI has the potential of making trademark design easier and cheaper while degrading the quality and, thereby the value, of the trademark regime.

In short, the trademark system faces threats to its ability to reduce search costs for consumers by identifying a product's source. How can consumers have confidence in the value of a trademark if one cannot determine the extent to which the goods subject to the mark are a product of something other than the trademark holder, or have confidence in the ability of the mark-holder to thoroughly understand and judge what the AI might have done? The problem is exacerbated by disinformation, misinformation, and downright fraud—all of which can be enhanced with the use of AI. These issues, combined with the threat of a downward spiral to mediocracy and the potential for consumers to look outside the trademark system, undermine the value of the trademark system itself, and the system's ability to provide the value for which it was created.[233]

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228. Seng, *supra* note 224, at 305; c*f.* Burk, *supra* note 200, at 1704.

229. *See* Garon, *supra* note 226, at 44–45.

230. *See* Michael R. Grynberg, *AI and the "Death of Trademark,"* 108 KY. L.J. 199, 238 (2019) (noting that better evidence than inferences drawn by simply looking at a mark is available from sources such as reviews, seller product, information and message board discussions, which would require a consumer to invest far more in search costs than with an AI).

231. *See id.*

232. *See supra* Subpart IV.A.

233. *But see* USPTO REPORT, *supra* note 163, at 33 ("Most commenters . . . noted that . . . AI software would have no impact on trademark law or, alternatively, that the existing statutory and common law framework for trademarks in the United States is sufficiently flexible to address any such impact.").

Considering the entire intellectual property system—from patents, to trade secrets, to copyright, to trademark—the onward march of AI provides fundamental peril. For patent and trade secret, the danger flows from the interaction of AI with the definition of protectible creations and information. The discordance could result in a significant shrinkage in the pool of what is subject to protection by patent and trade secret.

For copyright and trademark, the danger flows from factors that shake the myth of a copyright or a trademark, thereby undermining the value proposition. As with all intangibles, the value rests on the shared conviction that we know what they are and can identify their source. To the extent AI weakens the public's confidence in these shared convictions and the value of these rights, it tarnishes the mystique and blurs our vision of the value. At base, therefore, AI threatens to profoundly shrink the value proposition of these rights.

The following Part explores methods of buttressing the value of the four intellectual property systems by trimming the rights to reinforce them and by restoring confidence. Describing these pathways requires a brief allegory.

V. THE ALLEGORY OF THE DIAMOND

In a tale set in pre-Victorian England, a capricious queen, with a penchant for towering hairdos, presides over glittering social seasons in which young, eligible maidens vie for the hand of eligible bachelors.[234] Each year, the queen declares one maiden to be the season's diamond—an exceptionally rare, stunning, and refined young woman, who therefore becomes the most sought-after commodity.[235]

As in the tale, diamonds have become the archetype of rare quality and exceptional value. Adding to that mystique is a diamond's reputation as a symbol of the difficult-to-obtain, life-long commitment of marriage. Of course, the lofty perch of the diamond has come under assault with the arrival of lab-grown diamonds, which are easier to produce and difficult to distinguish from "the real thing."[236] The price of natural diamonds has fallen, amidst uncertainty over the origin of gems and their long-term value.[237] And as the mystique fades,

234. *See Bridgerton* (Shondaland & CVD Productions Dec. 25, 2020) (portraying the members of the Bridgerton family as central characters of a television series that is set in a racially integrated society whose issues are, at times, pre-Victorian and, at times, decidedly modern).

235. *See id.* Readers should note that the language in the text is used in the consciously ironic manner of the series.

236. Thomas Moore, *Lab Grown Diamonds Almost Impossible to Differentiate from Real Gems*, SKY NEWS (May 3, 2018, 8:03 AM UTC), https://news.sky.com/story/lab-grown-diamonds-almost-impossible-to-differentiate-from-real-gems-11356476.

237. Thomas Biesheuvel, *The Diamond Industry Is Coping with a 20% Price Drop and Worries Gen Z Isn't All That Interested in Its Stones*, FORTUNE (Nov. 11, 2023, 7:09 AM PST), https://fortune.com/2023/11/11/diamond-industry-faces-price-plunge-gen-z-uncertainty.

some brides are turning to other gemstones to express their individual styles.[238] The author is not aware of research tying the move away from diamond engagement rings to the reduction in value of diamonds from the emergence of lab-grown diamonds.[239] Nevertheless, consumer preferences—and therefore value in the market—can be linked to intangible associations and imagery.[240]

The saga of the beleaguered diamond provides the perfect allegory for AI's potential impact on intellectual property. Moreover, as the Part below describes, the diamond saga points to pathways for ensuring the long-term strength and viability of the intellectual property system. Together, the two solutions mitigate the problems described, with some regimes benefitting from both solutions. Most importantly, the two solutions also mesh with the theoretic underpinnings of the regimes.

A. PRESERVING VALUE BY LIMITING

As any monopolist (or economist) can tell you, the best way to increase value is to restrict supply.[241] In fact, the diamond industry traditionally preserved the high price of diamonds by limiting the amount of product flowing from its diamond mines onto the market.[242] And therein lies a pathway for shoring up the value of intellectual property: limit the supply of products subject to protection, casting the net only around the more remarkable and more protectible products, thereby preserving value.

The title of this Part (Preserving Value by Limiting) does not mean that the limits haphazardly imposed by AI are the appropriate ones. Yes, the rapid expansion of AI may make some information and some creations—ones that currently receive protection—impossible or impractical to protect, but it can do

238. Samantha Simma, *Alternative Gemstones: A Girl's Other "Best Friends*," GRAND WEDDING, https://jacksonholewedding.com/alternative-gemstones/ (last visited Dec. 15, 2024) (citing reports that a quarter of brides-to-be are leaning towards alternative gemstones).

239. *But cf.* Paul Zimnisky, *Lab-Diamond Sales Grow as Prices Fall*, PAUL ZIMNISKY: DIAMOND ANALYTICS (Jan. 2, 2023), https://www.paulzimnisky.com/Lab-Diamond-Sales-Grow-as-Prices-Fall ("[A]s the price point between natural and lab-diamonds continues to widen, consumer's intuitive perception of the two products is also likely to naturally diverge[] . . . .").

240. *See, e.g.*, Jessica Keech, Maureen Morrin & Jeffrey Steven Podoshen, *The Effects of Materialism on Consumer Evaluation of Sustainable Synthetic (Lab-Grown) Products*, 37 J. CONSUMER MKTG. 579, 585 (2020) (finding that consumers tend to perceive lab-grown diamonds as inferior, but emphasizing the ethicality of lab-grown diamonds can positively influence consumer perception and preference of these diamonds); *cf.* Humberto Fuentes, Jorge Vera-Martinez & Diana Kolbe, *The Role of Intangible Attributes of Luxury Brands for Signaling Status: A Systematic Literature Review*, 47 INT'L J. CONSUMER STUD. 2747, 2754 (2022) (highlighting that some consumers prefer luxury brands as a means of self-expression).

241. Richard A. Posner, *Natural Monopoly and Its Regulation*, 21 STAN. L. REV. 548, 552 (1968); JOAN ROBINSON, THE ECONOMICS OF IMPERFECT COMPETITION 143–58 (2d ed. 1969) (1933).

242. *See* G. Ariovich, *The Economics of Diamond Price Movements*, 6 MANAGERIAL & DECISION ECON. 234, 236 (1985) (noting that De Beers, one of the largest supplier of diamonds, influences prices by "tuning the volume of supply"); Phoebe Shang, *The Fifth C: What Determines Diamond Cost?*, INT'L GEM SOC'Y, https://www.gemsociety.org/article/what-determines-diamond-cost (last visited Dec. 15, 2024) (explaining that De Beers controls the market value of diamonds by decreasing supply when prices begin to fall).

so in ways that have the potential to undermine value. AI makes trademark fraud easier; its ability to extract prior art from all data everywhere[243] could make a large swath of patents unsustainable while its ability to replicate invention could make large swaths of trade secrets unprotectible; its ability to rapidly and cheaply create mediocre works that fall within the subject matter of copyright and trademarks of mediocre quality reduce the value of works under protection in both realms, and, of course, the use of training data undermines the protectability of copyrighted works.[244] In contrast to the haphazard conflicts developing as AI and intellectual property clash on the ground in real-time, the law can shape considered, appropriate limitations that operate to preserve value in the face of the AI onslaught.

The timing for trimming intellectual property is ripe. Scholars have expressed concern for some time about the proliferation of intellectual property rights.[245] The expansion of electronic communication brings an explosion of material subject to copyright, from e-mail messages, to computer code, to datasets, to Instagram photos, to YouTube and TikTok videos, and to social

243. This assumes, of course, that one is referencing data included in the AI's training data, which could have been drawn from the Internet along with disparate other sources.

244. On the flip side, AI can also facilitate better detection of intellectual property infringement. *See* Du, *supra* note 221, at 15, 17 ("AI/ML is increasingly proving to be a valuable tool globally for protecting brand owners, including the surveillance to detect trademark infringement and to fight bad faith trademark registrations."); Khachatryan, *supra* note 221, at 284–85 ("Various companies, like Entrupy, Red Points, and Cypheme, provide solutions for companies and brands. These companies use artificial intelligence to 'analyze materials, colors, packaging and other attributes to spot fakes.'"); Shine Sean Tu, *Use of Artificial Intelligence to Determine Copyright Liability for Musical Works*, 123 W. VA. L. REV. 835, 858–59 (2021) (proposing AI as an expert witness "to help the court dissect . . . work and determine if there is a 'similarity of ideas' between the two works. . . . [alternatively,] AI could dissect the reference work in a fashion where the non-copyrightable portions of the reference work are extracted and only the expressive portions of the work are shown to the trier of fact"); *e.g.*, *Revolutionizing Patent Infringement: Role of AI in Patent Infringement Detection and Monetization*, XLSCOUT, https://xlscout.ai/revolutionizing-patent-infringement-role-of-ai-in-patent-infringement-detection-and-monetization#:~:text=Efficient%20Infringement%20Detection%3A%20AI%20algorithms,setting%20the%20stage%20for%20monetization (last visited Dec. 15, 2024) (providing patent infringement detection software as a service).

245. *See, e.g.*, Mark A. Lemley, *Romantic Authorship and the Rhetoric of Property*, 75 TEX. L. REV. 873, 898 (1997) (reviewing JAMES BOYLE, SHAMANS, SOFTWARE, AND SPLEENS: LAW AND THE CONSTRUCTION OF THE INFORMATION SOCIETY (1996)) ("[T]here is currently a strong tendency to 'propertize' everything in the realm of information. Intellectual property law is expanding on an almost daily basis as new rights are created or existing rights are applied to give intellectual property owners rights that they never would have had in an earlier time."); Ben Depoorter, *The Several Lives of Mickey Mouse: The Expanding Boundaries of Intellectual Property Law*, 9 VA. J.L. & TECH. 1, 15–16 (2004) (highlighting "three main strands of criticism" on the proliferation of intellectual property rights: (i) favoring the protection of producers over the protection of incentives of authors, (ii) private control rights hindering technological innovation and artistic creativity, and (iii) expanding copyright protections to include control of the content itself); Shubha Ghosh, Foreword, *Why Intergenerational Equity*, 2011 WIS. L. REV. 103, 106 (2011) ("[T]he structure of intellectual property rights needs to reflect concerns other than wealth because a focus solely on wealth maximization invariably leads to a proliferation of intellectual property rights. Wealth maximization is a blunt tool that offers little guidance to structuring intellectual property rights other than more is better.").

media posts that are longer than a short phrase.[246] Any expression fixed in a tangible medium can be protectible, as long it contains a "modicum of creativity."[247] And as described below, the bar for a modicum of creativity remains so low as to be almost non-existent.

Similarly, with the vast and largely untested expansion of trade secret law into areas including employer contracts and pharmaceutical pricing, scholars have argued that the use of trade secrets has expanded well beyond what is supportable under the theory or precedent.[248] In patent law, the sheer number of patents issued has more than doubled since the turn of the millennium.[249] Once again, scholars, and even some Supreme Court decisions, have chimed in to express their doubts about patent validity issues ranging from obviousness, to subject matter coverage, to disclosure.[250] The proliferation of secondary and

246. *See, e.g.*, Adithya Vikram Sakthivel, *Emails and Copyright*, MEDIUM (Dec. 12, 2019), https://medium.com/ip-weekly/emails-and-copyrights-14e673f0e89c; U.S. COPYRIGHT OFF., COPYRIGHT REGISTRATION OF COMPUTER PROGRAMS (March 2021), https://www.copyright.gov/circs/circ61.pdf; *Terms of Service*, INSTAGRAM (July 26, 2022), https://help.instagram.com/581066165581870 ("We do not claim ownership of your content that you post on or through the Service and you are free to share your content with anyone else, wherever you want."); *Terms of Service*, YOUTUBE (Dec. 15, 2023), https://www.youtube.com/static?template=terms ("You retain ownership rights in your Content."); *Terms of Service*, TIKTOK (Nov. 2023), https://www.tiktok.com/legal/terms-of-service ("[Y]ou or your licensors will own any User Content . . . you upload or transmit through the [platform]."); *Terms of Service*, FACEBOOK (July 26, 2022), https://www.facebook.com/terms.php?ref=pf ("You retain ownership of the intellectual property rights (things like copyright or trademarks) in any such content that you create and share on Facebook . . . ."); *Terms of Service*, X (Sept. 29, 2023), https://x.com/en/tos ("You retain your rights to any Content you submit, post or display on or through the Services.").

247. *See* Feist Publ'ns, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 346 (1991).

248. *See, e.g.*, Feldman & Graves, *supra* note 20, at 84 (expressing skepticism over claiming pharmaceutical pricing as a trade secret because "[i]t is not an idea, and it certainly is not the product of innovation"); Peter S. Menell, *Tailoring a Public Policy Exception to Trade Secret Protection*, 105 CALIF. L. REV. 1, 36, 45–46 (2017) (advocating for a public policy exception to trade secret protection because "overly broad trade secrecy protection interferes with law enforcement"); Graves & Katyal, *supra* note 20, at 1342 (noting that trade secrecy has moved beyond its use as a tool against misappropriation and has expanded "into nontraditional subject matter with only attenuated connection to a competitive advantage in research and development, sales, or marketing"); Deepa Varadarajan, *Trade Secret Fair Use*, 83 FORDHAM L. REV. 1401, 1405 (2014) (highlighting that instead of using trade secret law to keep confidential information from bad actors, "companies increasingly use trade secret law to shield information from potential 'right' hands—e.g., the scrutinizing eyes of government regulators, consumers, public watchdog groups, and significant improvers" due to the lack of ex post limiting doctrines).

249. U.S. PAT. & TRADEMARK OFF., U.S. PATENT ACTIVITY: CALENDAR YEARS 1790 TO THE PRESENT (Dec. 18, 2024), https://www.uspto.gov/web/offices/ac/ido/oeip/taf/h_counts.htm.

250. *See, e.g.*, Matthew Sag & Kurt Rohde, *Patent Reform and Differential Impact*, 8 MINN. J.L., SCI. & TECH. 1, 2 (2007) (highlighting that many industry leaders have "expressed concern that too many patents are issued for 'inventions' that are obvious, vague or already widely used"); KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 427 (2007) ("[T]he results of ordinary innovation are not the subject of exclusive rights under the patent laws. Were it otherwise patents might stifle, rather than promote, the progress of [the] useful arts."); Paul R. Gugliuzza, *The Procedure of Patent Eligibility*, 97 TEX. L. REV. 571, 573–74 (2019) (noting that the Court has recently "reinvigorated the patent-eligible subject matter requirement" and discussing Bilski v. Kappos, 561 U.S. 593 (2010), and Alice Corp. v. CLS Bank Int'l, 573 U.S. 208 (2014)); *Bilski*, 561 U.S. at 609 (denying a patent application for "the concept of hedging risk and the application of that concept to energy markets" for failure to be a patentable subject matter because these claims are "abstract ideas"); *Alice Corp.*, 573 U.S. at 217–18 (denying a patent application for computer software to mitigate settlement risk for

tertiary patents is a particular problem, given concerns about obviousness.[251] Trademark law also has expanded broadly, with the development of doctrines related to trademark dilution, including blurring and tarnishment, both of which are the subject of debate.[252] Finally, the ability of companies to expand the coverage of intellectual property regimes by contracting for larger coverage raises serious concerns. The issues particularly arise through the frequent addition to trade secret contracts and regulations of the catch-all phrase "confidential information," as well as attempts to contract around the definitions of rights in copyright and patent.[253]

As with the diamond allegory, rarity enhances reward and expansions of supply are likely to undermine value.[254] Thus, the modern expansion of intellectual property rights, whether welcome or controversial, likely reduces the allure of each protected work. To offer a simple example, imagine that the definition of what is considered a protected molecule has expanded, resulting in a proliferation of patented molecules to test against a particular disease state. If you ask too much for your molecule, a developer will turn somewhere else; but if yours is the only game in town, your pricing power is greatly enhanced. In the same vein, if the market is crammed with low-value products, the search for the diamond becomes more difficult (and costly) for consumers. And if you have to

failure to state a patentable subject matter because it lacks an "'inventive concept'—*i.e.*, an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the ineligible concept itself'"); Alan Devlin, *The Misunderstood Function of Disclosure in Patent Law*, 23 HARV. J.L. & TECH. 401, 404 (2010) ("The sheer volume of outstanding patents, coupled with the lack of specificity in many claims . . . makes an exhaustive search of the prior art expensive."); John M. Olin, Note, *The Disclosure Function of the Patent System (Or Lack Thereof)*, 118 HARV. L. REV. 2007, 2023–24 (2005) (discussing flaws in patent disclosures).

251. *See* Aaron S. Kesselheim & Jonathan J. Darrow, *Hatch-Waxman Turns 30: Do We Need a Re-Designed Approach For the Modern Era?*, 15 YALE J. HEALTH POL'Y, L. & ETHICS 293, 304 (2015) ("[S]econdary patented structures may not add to the efficacy or safety of the original drug. Moreover, the patents themselves are more likely to be invalid as lacking novelty or for being obvious improvements on prior patented structures.").

252. *See, e.g.*, Burk, *supra* note 200, at 1706–07 (referencing "the frequently lamented expansion of trademark law to situations that have little to do with consumer confusion," and citing to Rochell C. Dreyfuss, *Expressive Genericity: Trademarks as Language in the Pepsi Generation*, 65 NOTRE DAME L. REV. 397, 398 (1990)); *see also id*. at 107 ("[d]espite the repeated mantra of 'confusion' and 'source,' trademark doctrine is being continually stretched and manipulated to try to fit modern branding practices"; first citing to Mark A. Lemley & Mark P. McKenna, *Irrelevant Confusion,* 62 STAN. L. REV. 413, 414 (2010); and then citing to Glynn S. Lunney Jr., *Trademark Monopolies,* 48 EMORY L.J. 367, 371–372 (1999)); Lemley & McKenna, *supra* (analyzing modern cases as an improper expansion of trademark beyond likelihood of source confusion); Lunney Jr., *supra* (arguing that modern trademark law has shifted from a doctrine for the protection of consumer interests to a form a property right for trademark holders); Ann Bartow, *Likelihood of Confusion*, 41 SAN DIEGO L. REV. 721, 737, 744–48, 817 (2004) (discussing the lack of clarity for evaluating consumer confusion and arguing that this lack of clarity has enabled mark holders to expand and broaden their rights under the guise of protecting consumers).

253. *See, e.g.*, FELDMAN, RETHINKING, *supra* note 181, at 147–58.

254. *See, e.g.*, ROBERT H. FRANK & BEN S. BERNANKE, PRINCIPLES OF MICROECONOMICS 87–88 (4th ed. 2009); DAVID SHAPIRO, DANIEL MACDONALD & STEVEN A. GREENLAW, PRINCIPLES OF MICROECONOMICS 76–77 (3d ed. 2022).

kiss a lot of frogs to find the prince, the mystique and allure of frogs—not to mention frog-kissing—declines considerably.

The modern expansion of intellectual property rights meshes well with the reshaping needed to preserve value in the face of the AI onslaught. The adaptations will not require wholesale reimaging of the various regimes. In particular, the patent and copyright regimes contain doctrines that are largely ignored but have great potential for measuring the value of the human contribution to a protected work and appropriately limiting the pool of protected works.

Within the five elements required to sustain patentability lies the sadly ignored doctrine of "usefulness." One would not expect the doctrine to languish so extensively, given its pedigree. The Constitution dedicates one of the few words in the intellectual property clause to the general concept, referencing the grant of power to Congress "[t]o promote the Progress of Science and useful Arts."[255] In the legislative context, the usefulness requirement appeared in the opening of the Patent Act of 1790[256] and continues to occupy a prominent position in today's Patent Act, which specifies: "Whoever invents or discovers any new and *useful* process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent."[257]

Nevertheless, as Risch explains, "usefulness has been largely ignored. [It] has transformed into the toothless and misunderstood 'utility' doctrine, which requires that patents only have a bare minimum potential for use."[258] This is not

255. U.S. CONST. art. I, § 8, cl. 8.

256. Patent Act of 1790, ch. 7, § 1, 1 Stat. 109 (repealed 1793).

257. 35 U.S.C. § 101 (emphasis added).

258. *See* Michael Risch, *Reinventing Usefulness*, 2010 BYU L. REV. 1195, 1197, 1199 (recommending utility be defined as "commercial utility," which would "seek[] to ensure that inventions are worth more to the public than they cost"); DAN L. BURK & MARK A. LEMLEY, THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT 110–11 (2009) (noting the anemic quality of the doctrine, with some recommending ways to revitalize it); Rebecca S. Eisenberg & Robert P. Merges, *Opinion Letter as to the Patentability of Certain Inventions Associated with the Identification of Partial cDNA Sequences*, 23 AIPLA Q.J. 1, 4 (1995); Phanesh Koneru, *To Promote the Progress of Useful Art[icle]s?: An Analysis of the Current Utility Standards of Pharmaceutical Products and Biotechnological Research Tools*, 38 IDEA 625, 641 (1998); Note, *The Utility Requirement in the Patent Law*, 53 GEO. L.J. 154, 156 (1964); s*ee also 2107 Guidelines for Examination of Applications for Compliance with the Utility Requirement*, U.S. PAT. & TRADEMARK OFF., https://www.uspto.gov/web/offices/pac/mpep/s2107.html (last visited Dec. 15, 2024) (collecting cases and endorsing the Federal Circuit's position that an invention lacks utility only when the claimed device is "totally incapable of achieving a useful result" (citing Brooktree Corp. v. Advanced Micro Devices, Inc., 977 F.2d 1555, 1571 (Fed. Cir. 1992)); Christopher Buccafusco & Jonathan S. Masur, *Drugs, Patents, and Well-Being*, 98 WASH. U. L. REV. 1403, 1407 (2021) (proposing that policymakers remove many of the legal protections for patents with "an *insubstantial* effect on human welfare" so they are easier to challenge and therefore invalidate); E.I. du Pont de Nemours & Co. v. Berkley & Co., 620 F.2d 1247, 1260 n.17 (8th Cir. 1980) (noting in the context of the subcategory of utility regarding whether an invention is inoperable, "[a] small degree of utility is sufficient"); *In re* Brana*,* 51 F.3d 1560, 1566–67 (Fed. Cir. 1995) (holding that an invention only partially successful in achieving a useful result remains patentable under the utility doctrine).

to suggest that courts have completely avoided the utility doctrine in overturning patents.[259] Nevertheless, the doctrine's applications are few and far between.

The development of a robust doctrine of usefulness could result in a significant trimming of the inventions that are patentable. Along these lines, scholars have suggested restricting patents that are not better than other things on the market,[260] patents that would cost the consumer more than the invention costs to make,[261] or patents for which there is no social usefulness. These types of approaches could form the beginning of a useful doctrine of usefulness. Only the truly inventive, the gem amidst the fool's gold, would be eligible for protection.

Limiting patent protection to the true gems could help shore up the value of patents, from the perspective that scarcity increases value. Moreover, it could blunt other impacts of AI described above.[262] Recall that if the conceptualization of a person having ordinary skill in the art includes that person using AI, then the sophistication of widely available, modern AI tools could threaten many protected inventions through their ability to more thoroughly comb the vast library of knowledge available. Limiting protection to the more inventive end of the scale makes it less likely for a PHOSITA, even one using AI as a tool, to find the invention in prior art, or even to find something that could be dredged out to demonstrate obviousness.

One might also consider shifting the analysis of prior art away from scrutinizing minute aspects of documents to testimony of those who actually use and invent current art. That shift would move the locus of the analysis away from the stronghold of AI and closer to the human realm.[263]

Moving beyond patents, the copyright regime houses its own feeble doctrine that could be activated in the service of preserving value. Specifically, copyright protection applies only to those works containing a modicum of creativity. In the definitive modern case on the topic, *Feist v. Rural Tel. Servs.*,

259. *See, e.g.*, Brenner v. Manson, 383 U.S. 519, 535–36 (1966); *In re* Fisher, 421 F.3d 1365, 1378–79 (Fed. Cir. 2005); *In re* Ziegler, 992 F.2d 1197, 1203 (Fed. Cir. 1993).

260. *See* Robin C. Feldman, David A. Hyman, W. Nicholson Price II & Mark J. Ratain, *Negative Innovation: When Patents Are Bad for Patients*, 39 NATURE BIOTECHNOLOGY 914, 915 (2021) ("One avenue for [patent] reform might be to enforce a more rigorous utility requirement for pharmaceutical patents, demanding that they actually improve social welfare relative to the prior art."); Buccafusco & Masur, *supra* note 258, at 1411 (proposing that the USPTO and courts could interpret § 101's useful requirement as entailing "an affirmative requirement that patent applicants establish that their inventions are likely to improve social welfare relative to the status quo").

261. *See* Risch, *supra* note 258, at 1199.

262. *See supra* Subpart III.A.

263. *Cf.* Teo Susnjak, ChatGPT: The End of Online Exam Integrity? 16 (Dec. 19, 2022) (unpublished manuscript) (on file at https://arxiv.org/abs/2212.09292) (considering oral exams in response to ChatGPT's current uni-modal capabilities—it can currently only accept text-inputs); Michael Neumann, Maria Rauschenberger & Eva-Maria Schön, *"We Need To Talk About ChatGPT": The Future of AI and Higher Education* 3 (2023), https://www.researchgate.net/publication/369039047_We_Need_To_Talk_About_ChatGPT_The_Future_of_AI_and_Higher_Education (citing Susnjak and recommending complimentary oral examinations to ensure response is human-based, not AI-generated). Of course, with humans, one always risks reducing the evidence to a battle of the experts, perhaps even featuring the usual suspects.

the Supreme Court explained that "the requisite level of creativity is extremely low; even a slight amount will suffice."[264] The Justices then use a variety of phrases to indicate that the minutest morsel of creativity will suffice, explaining that the test would require that "the creative spark is utterly lacking," the creativity is "so trivial as to be virtually nonexistent," and the work is "devoid of even the slightest trace of creativity."[265]

Admittedly, creativity is a tricky notion to define with any degree of clarity.[266] VerSteeg makes a valiant attempt in a 1993 piece, reaching to philosophers, cognitive scientists, and psychoanalytic theorists in search of a definition.[267] In the end, VerSteeg concludes that the law should just avoid the inquiry altogether and merely satisfy the creativity analysis by comparing the degree of difference between the work and prior works to which the author had access.[268]

Hughes also bemoans the state of copyright's current iteration of the creativity doctrine. He argues that the Justices in *Feist* ask judges to search for creativity "by detecting small amounts with the accuracy of a Geiger counter," and ignore "Justice Holmes's thundering admonition in *Bleistein* . . . that judges are *not* to make aesthetic judgments."[269] In the purity of the form identified by the Supreme Court, however, the modicum-of-creativity doctrine provides only a modicum (or even less) of a gate-keeping function for copyright. In an era in which every thought dashed off from the top of one's head as an e-mail, text, or social media post is the potential recipient of copyright protection, more is certainly needed.[270] There are models available in the academic literature, including focusing on the tools used by the creator or the creator's process. Describing these and other proposed approaches, let alone choosing among them, would absorb more words on this Part alone than law journals allow for a single article. Nevertheless, the point of this article is simply that a more robust doctrine, one that trims the forest of works subject to copyright protection, could

264. *See* Feist Publ'ns, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 345 (1991) (holding, nevertheless, that alphabetical residential telephone listings do not satisfy the modicum of creativity standard).

265. *See id.* at 358–59, 362; Russ VerSteeg, *Rethinking Originality*, 34 WM & MARY L. REV. 801, 821 (1993) (discussing these quotes in describing the *Feist* case).

266. *See* VerSteeg, *supra* note 265, at 829–32 (describing efforts to define creativity and copyright doctrine's effort to avoid judges making aesthetic judgments).

267. *Id.* at 826–28.

268. *See id.* at 833.

269. *See* Justin Hughes, *Restating Copyright Law's Originality Requirement*, 44 COLUM. J.L. & ARTS 383, 390 (2021). In discussing and criticizing the ongoing Restatement of Copyright project, Hughes then argues that the Restatement reporters are perhaps too faithful to *Feist*, and that shifts in terminology among the different subparts of the draft Restatement reflect *Feist* on one hand and what courts are actually doing on the other, while failing to explain what the lower courts are doing. *See id.* at 390, 392. In the interests of full disclosure, the author notes that she serves as an advisor on the Restatement of Copyright project. Her explorations in the current academic article reflect her personal musings and are unrelated to any drafts or discussions within the Restatement project.

270. *But cf. AI and Intellectual Property Legislative Hearing*, *supra* note 178, at 2 (written testimony of Sandra Aistars, Clinical Professor, George Mason University Antonin Scalia Law School) (explaining that "Feist should continue to apply in the context of AI-assisted creative works").

enhance value by focusing protection on works of greater creativity without wading into aesthetic judgments. That shift alone, however, is insufficient to mitigate the effects of AI described above.

In contrast to the patent and copyright regimes, no dormant or moribund doctrines stand out in trade secret as a handy vehicle for enhancing value. This may occur, in part, because the legal precedents are few and far between, given the recent flowering of trade secrets and the passage of federal legislation to provide federal, civil, trade secret rights. Nevertheless, enhancing the application of basic trade secret theories and principles will be critical as the law develops to reduce the wild proliferation. There are opportunities to strengthen doctrines within trade secret in a manner that reduces the proliferation and focuses the rights on more valuable trade secret information, thereby enhancing the value of the entire regime. Basic principles currently at risk include: 1) the notion that a trade secret functions to police market-competitive boundaries and guard against misappropriation, rather than as a tool for open-ended concealment;[271] 2) the "fact that a company would suffer competitive harm if information were released does not mean, in and of itself, that release of the information would implicate trade secret rights";[272] and 3) the idea that trade secret is valuable information developed by one company or in cooperation with others and that, therefore, price terms negotiated in an adversarial process between parties cannot later be claimed by both as a joint invention.[273]

Trade secret law might, nevertheless, benefit from clarifying and adjusting the doctrines related to the readily ascertainable criteria. If AI can develop a list of solutions that includes the one being claimed as a trade secret, perhaps part of the value is the human's ability to choose among options for the one that will actually work. If the AI does not choose the correct one in particular, perhaps the human invention should still be protectible.

Considering these three doctrines, copyright, patent, and trade secret, shrinking the pool in the manner described above not only would enhance value in the abstract, it also would address the concern that AI can easily develop whatever information humans develop or assemble to assist their business. If AI can easily and independently develop the solution, perhaps it is, indeed, of lesser value and less deserving of protection, assuming that the AI also can choose the best among options. Finally, the concerns are consistent with the underlying doctrines and theoretic concepts of the regimes.

VI. GOOD HOUSEKEEPING SEAL OF APPROVAL

For generations, consumers have known of the eponymous Good Housekeeping Seal of Approval. Launched by the Good Housing Institute in 1900 and in active use for over 115 years, the Good Housekeeping Seal of

271. *See* Graves & Katyal, *supra* note 20, at 1337.
272. Feldman & Graves, *supra* note 20, at 81.
273. *See id.* at 97–99.

Approval is an emblem indicating that a consumer product has been tested by experts, evaluated, and deemed trustworthy for public use.[274] Above all other consumer rating services, this one has become a household name and even a generic term for something of reliable quality.

As described above, both the copyright and trademark regimes suffer from confusion over source of the material, leading to a reduction in consumer confidence, a loss of mystique, and the resulting damage to the value proposition embodied in the systems.[275] For copyright, does an AI-assisted product or service draw from reliable training data? Does the work actually belong to the AI product providing it or does it infringe on someone else's work? For trademark, is the product actually made by the trademark holder, and does it constitute the trademark holder's quality? Or is the product simply hijacking or stealing the product's designation, likely substituting inferior quality? Thus, the copyright and trademark regimes could benefit from a certification system.

Even the patent regime could benefit from a certification system, although from a slightly different perspective. A certification body could confirm whether a product was produced with the assistance of AI. Some scholars have suggested that the answer should determine the level of scrutiny required for patentability.[276] For the purposes of this article, however, a certification body could contribute to reliable consumer information. Some consumers may value a product designed and produced without AI, similar to the current notions of hand-crafted, organic, or non-GMO (free of genetically modified organisms). The certification body could ensure compliance with its definitions of AI-free. More than simply creating a niche product of higher value—hence higher price—for consumers willing to pay for it, an AI-free certification could help

274. *See, e.g.*, Peter Mullen, *Why Customer Service Needs Its Own 'Good Housekeeping'-Style Seal Of Approval*, FORBES (Jan. 5, 2023, 07:30 AM EST), https://www.forbes.com/sites/forbescommunicationscouncil/2023/01/05/why-customer-service-needs-its-own-good-housekeeping-style-seal-of-approval; Carleigh Stiehm, *Celebrating 110 Years of the Good Housekeeping Seal*, HEARST (Aug. 22, 2019), https://www.hearst.com/-/celebrating-110-years-of-the-good-housekeeping-seal; *Good Housekeeping Institute Product Reviews*, GOOD HOUSEKEEPING, https://www.goodhousekeeping.com/institute/about-the-institute/a19748212/good-housekeeping-institute-product-reviews/#seals (last visited Dec. 15, 2024).

275. *See* discussion *supra* Part.IV.

276. Heon, *supra* note 164, at 384 (proposing that patent applications should require disclosure of the involvement of AI in the invention process and that there should be a separate standard of obviousness for AI inventions); Jessica A. Caso, Note, *AI Inventorship: It's Time to Cache in the Latest Challenge to Patentability in the Modern Era*, 35/36 N.Y. INT'L L. REV. 53, 73–74 (2023) (same); *see also* Tim W. Dornis, *Artificial Intelligence and Innovation: The End of Patent Law as We Know It*, 23 YALE J.L. & TECH. 97, 150–51 (2020) (suggesting that AI-generated inventions receive a lower level of patent protection because "it will be less costly to artificially invent"); Mehdi Poursoltani, *Disclosing AI Inventions*, 29 TEX. INTELL. PROP. L.J. 41, 59–64 (suggesting "AI patents should be held to a higher standard of disclosure"); *cf.* Burk, *supra* note 200, at 1701 (arguing that intellectual property will shift towards regimes that can confirm authenticity, meaning human-created, and suggesting that "trademark may come to support a somewhat orthogonal marketing position, fostering an artificial scarcity that identifies otherwise indistinguishable goods produced by human creativity rather than AI generativity"); Ebrahim, *supra* note 213, at 202–05 (proposing enhancement of disclosure requirements for AI-generated output of invention that were "hardly (or never) developed" or which were "concealed through an unexplainable algorithmic inventive process").

restore certainty and consumer confidence, particularly in this period of rapid transition.

As noted above, the theoretic underpinnings of the intellectual property regimes do not include perpetuation of the intellectual property systems themselves. As Burk noted in a humorous aside, if AI truly could make innovation cheap and instantaneous, we would not need the cumbersome patent system. Whether one is considering fraud, or increased searching costs, or confidence in the value of copyrights and patents themselves, the effects that are undermining value in the system also undermine the theoretic underpinnings. In other words, these systems cannot do their jobs if the value myth evaporates—at least not unless AI has managed to replace them effectively.

Various private certification and evaluation efforts exist,[277] available by searching simple phrases such as "is 'product name' legit." Online retailers try to reassure customers of their efforts to police fraud, but those efforts fall short, or on deaf ears, as consumers increasingly turn to third-party chat-boards and evaluation services.[278] However, the proliferation of these sources merely increases consumer search costs and bewilderment.[279] What types of standards does one evaluation service use in comparison to another? Moreover, how can a simple consumer know whether the certification group or even the product review is legitimate itself? What in today's world can be trusted or understood? A standardized, certification body—one that is focused on reassuring consumers in the rapidly changing environment of AI—could help stabilize value throughout the intellectual property regimes. Of course, the body could do other things as well, including the establishment of best practices for responsible use of AI. The focus of this article, however, is on reliability and trust.

The federal government would be in the best position to establish a certification body of this kind, given the government's ability to coordinate efforts and impose restrictions on private companies. The effort could be modeled after emblems such as USDA certifications from the Department of Agriculture or FDA-approved notices. A federal body also has the advantage of freedom from antitrust worries. When a group of competitors gets together to collaborate, antitrust lawyers—not to mention antitrust authorities—normally break out in hives. Key antitrust doctrines are designed to ensure that competitors fight each other fiercely for consumer attention, rather than shaking

277. *See, e.g.*, THINGTESTING, https://thingtesting.com (last visited Dec. 15, 2024) (online forum where people can leave reviews of various products and brands).

278. Amazon Staff, *The Latest from Amazon's Counterfeit Crime Unit*, AMAZON NEWS (Dec. 2, 2024, 7:00 AM), https://www.aboutamazon.com/news/policy-news-views/amazon-counterfeit-crimes-unit-latest-updates-2024 (providing regular news and updates regarding Amazon's Counterfeit Crimes Unit which is described as "a global team dedicated to partnering with law enforcement, brands, and other stakeholders to disrupt counterfeiters and their networks").

279. *See generally* Sheena S. lyengar and Mark R. Lepper, *When Choice is Demotivating: Can One Desire too Much of a Good Thing?*, 79 J PERSONALITY & SOC. PSYCH. 995 (2000) (studying how differing amounts of options affect consumer motivation and satisfaction, with results suggesting that having too many products to choose from can actually undermine a consumer's willingness to make a purchase).

hands and agreeing on a coordinated business approach that all must follow. The risk that such a gathering would be branded a mark of collusion or oligopolistic behavior could deter the wise from participating.

Government also would have an easier time limiting supply than individual merchants. In addition to the ever-present risk that members of the group or new entrants might open the supply spigot, the government sets the definition and ownership rules of intellectual property. It is more difficult to defect (or cheat) when someone else controls the rules of the game.

On the flip side, creation of a federal certification would require Congressional action to establish a regulatory agency. Such a scenario is politically challenging, given that federal legislators have been struggling against paralysis for several administrations, as the nation remains deeply divided. Thus, a coordinated industry approach may have a better chance of success, if such an effort can tiptoe past antitrust barriers.

Certification could come from the intellectual property creator's industry or from the AI industry itself. Looking first from the perspective of the AI industry, given its expertise with its own products and cutting-edge AI tools, that industry may be best suited to engage in a coordinated, certification endeavor. In addition, the AI industry, particularly its more established players, has an incentive to police itself, along with any questionable uses of AI. The greatest fear for the major players is the potential reputational harm imposed by rogue actors and irresponsible elements. Perhaps, just perhaps, if industry can get its own house in order, there will be less of a need for government to step in.

Ordinarily, one would be loath to allow the rules to be set by the large players, for fear that large players will design the rules to entrench their own market positions.[280] With AI, however, the large players may have less of an incentive to engage in anti-competitive conduct against smaller players. At least for the foreseeable future, the massive amount of computing power needed to run AI systems such as generative AI makes it difficult for a fresh upstart to disrupt and break into the industry. After all, this isn't about cobbling together computer components and banging away at code in your garage or dorm room.[281]

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280. Robin Feldman, *Defensive Leveraging in Antitrust*, 87 GEO. L.J. 2079, 2096–2105 (1999) (giving examples from the computer, medical services, and pharmaceutical industries in which an entrenched monopolist can use leveraging to prevent the emergence of competition); *see also* Patrick Todd, *Digital Platforms and the Leverage Platform*, 98 NEB. L. REV. 486, 496–504 (2019) (describing examples of monopolists in the digital platform market leveraging their market power and popularity to grant themselves a competitive advantage); *cf.* Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2008–10 (2007) (arguing that patent holders will sometimes leverage their right to exclude to enjoin products that are predominately noninfringing, which will "encourage rent seeking by patent trolls and discourage innovation by firms that design and manufacture complex products").

281. *See* WALTER ISAACSON, STEVE JOBS 68 (2011) (biographing Apple co-founder Steve Jobs' humble beginning: assembling Apple computers in his garage); Claire Hoffman, *The Battle For Facebook*, ROLLING STONE (Sept. 15, 2010), https://www.rollingstone.com/culture/culture-news/the-battle-for-facebook-242989 (outlining origins of Facebook in founder Mark Zuckerberg's Harvard dorm room).

The intellectual property industry, however, may object to handing the certification keys to the industry that is causing all the problems to begin with, from the perspective that it is like hiring the fox to guard the henhouse. Particularly for the creative content industries, the notion that AI will decide whether a work satisfies copyright may seem particularly ludicrous. After all, many copyright holders vehemently object to the unauthorized use of their work to train AI systems, especially when the systems subsequently use or imitate their work.[282]

Models for certification organizations exist in the form of either private organizations or as collaborations between industry and public bodies to set standards, although the guidelines set by these bodies may lack binding authority unless incorporated into voluntary contracts or government regulation.[283] With the type of certification body necessary for AI and IP, binding authority constitutes less of a requirement for success. Consumers vote with their wallets. Thus, the power of certification lies in the pockets of consumers. The coordination required to ensure that level of consumer power, however, would be easier if there is a governmental presence lurking in the room, if not downright governmental partnership.

With or without government participation, resolution by contract may ultimately provide the easiest route. For example, one option available for creative-content rights holders involves reaching a deal with the AI industry.[284] Once again, models exist. Consider when convenience is a barrier for infringers, for example, when a limited use would not justify the effort necessary to obtain a license. In that case, a coordinated body can make a small level of payment easier, and certainly cheaper, than the risk of a large infringement payment. ASCAP and BMI provide a classic model in which coordinated entities serve as

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282. *See, e.g.*, Complaint at 2, The N.Y. Times Co. v. Microsoft Corp., No. 1:23-cv-11195 (S.D.N.Y. Dec. 27, 2023); Complaint at 34–36, Doe 1 v. GitHub, Inc., 672 F. Supp. 3d 837 (N.D. Cal. 2022) (No. 4:22-cv-06823); Complaint at 2–3, Main Sequence, Ltd. v. Dudesy, LLC, No. 2:24-cv-00711 (C.D. Cal. Jan. 25, 2024); *see also* cases cited *supra* note 8; *Technical and Legal Risks of ChatGPT: How Prepared Are We with Laws on AI?*, INFO. SEC. BUZZ (July 30, 2024), https://informationsecuritybuzz.com/technical-and-legal-risks-of-chatgpt-how-prepared-are-we-with-laws-on-ai (describing the unfairness of a generative AI system in Canada that was given 32 pieces of a Disney illustrator's artwork, as an experiment, and has been generating new works in her style).

283. *See, e.g.*, RESPONSIBLE AI INST., THE RESPONSIBLE AI CERTIFICATION PROGRAM 5 (2022); Seng, *supra* note 224, at 305 (lauding a joint project of the Chinese-government owned Alibaba company and rights holders including "online enforcement practices, offline investigations such as conducting investigation purchases from suspect sellers, litigation strategies and tactics, and IPR-protection efforts" and arguing that "[t]he problem of counterfeits and fake goods can only be solved with greater transparency and cooperation between right holders, intermediaries, and public institutions"); s*ee also* Carlos I. Gutierrez, Gary Marchant & Lucille Tournas, *Lessons for Artificial Intelligence from Historical Uses of Soft Law Governance*, 61 JURIMETRICS J. (SPECIAL ISSUE) 133, 147 (2020) ("[A] well-known characteristic of soft law: its voluntary nature. As a governance alternative that lacks a means of regulatory enforcement, its compliance is contingent on the alignment of incentives.").

284. For example, the parties could agree, or courts could choose to enforce, limitations on the production of outright, identical copies of the works with royalties for the use of the works in training data. *See, e.g.*, Benjamin Mullin & Tripp Mickle, *Apple Explores A.I. Deals With News Publishers*, N.Y. TIMES (Dec. 22, 2023), https://www.nytimes.com/2023/12/22/technology/apple-ai-news-publishers.html.

a link between music copyright holders and businesses that play their music, estimating use and arranging for payment transfers that may be small.[285]

But sometimes principals are at stake, rather than convenience. For example, some copyright holders object to the use of their works in massive training data sets for AI, and other creative-content producers object to imitation of their signature approaches, even though style may not be protectible.[286] As noted, however, the march of technology rarely retreats, and throwing one's shoes into the machinery is more whimsical than effective. A well-worn adage from a 1916 political cartoon illustrates what is most important; to paraphrase, when someone says, "[i]t hain't th' money, but th' principle o' th' thing," just remember, it's about the money[287]. The adage is in line with the theoretical underpinnings of intellectual property in the United States, which are almost entirely utilitarian, in the economic sense of the term. Thus, although reaching a deal with infringers may seem odious to some, at the end of the day, it is better than the alternative.

Certification cannot solve all problems. Theft will always be a cat and mouse game, with enforcers enhancing their approaches as crafty thieves adapt. Individual rights holders, however, are less likely to prevail in the world of sophisticated AI tools than a coordinated and sanctioned certification body.

Nor can one find complete solace in the combination of both 1) limiting supply to enhance value and 2) a certification body. AI already has, and will continue to have, an impact on the intellectual property regimes. Nevertheless, the two pathways outlined in this Part could offer considerable progress in dampening the negative impact of AI.

CONCLUSION

As generative AI burst into the public consciousness in late 2022, scholars and commentators have pondered its impact on intellectual property. Of course, AI, and even large-language modeling, did not spring from the earth, fully formed in 2022. Rather, AI technology has been seeping into numerous aspects of society for over a decade, gaining proficiency and sophistication at a breakneck pace. Developments in recent years, however, have launched AI into the next phase at quantum speed, and new developments are unfolding more rapidly than ever. The impact of AI on societal issues across the board will be legion, with intellectual property receiving more than its fair share.

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285. *See ASCAP Payment System*, ASCAP, https://www.ascap.com/help/royalties-and-payment/payment (last visited Dec. 15, 2024); *About What We Do*, BMI, https://www.bmi.com/about (last visited Dec. 15, 2024).

286. *See supra* note 282.

287. *See When They Say It's Not About the Money, It's About the Money,* QUOTE INVESTIGATORS (Aug. 29, 2020), https://quoteinvestigator.com/2020/08/29/about-money/#r+438293+1+2; *see generally* ABE MARTIN, NEW SAYINGS & FAWN LIPPINCUT, VELMA'S VOW, A GRIPPING LOVE TALE (Abe Martin Publ'g Co. 1916) (showing cartoon and containing the original quote), *available at* https://webapp1.dlib.indiana.edu/inauthors/view?docId=VAA2428&doc.view=print.

Amidst this tumult, one aspect of AI has gone largely unnoticed. Specifically, as AI reaches its tendrils throughout society, it threatens to undermine the foundations of what we choose to protect with intellectual property and how the work we protect derives value, as well as how the intellectual property system itself derives value. These shifting sands undermine the purpose and value of intellectual property, threatening, in turn, our conceptions of the value of human invention and creativity. With some regimes, AI threatens to substantially shrink the pool of inventions that can sustain patentability; with other regimes, AI threatens to shake confidence, dissolve the mystique, and undermine the value proposition of the various intellectual property regimes themselves.

The intellectual property regimes, in many cases, do contain doctrines that can help measure the value of human contribution, although some are largely ignored. By reshaping and reinvigorating these doctrines, intellectual property can evolve to manage the advent of AI while preserving respect for human contributions. This approach can be enhanced with the creation of a single, universally accepted certification body. Together, the approaches of trimming to save and enhancing confidence would help mitigate the looming problems in all four regimes of intellectual property, with some regimes benefitting from both.

In closure, I return to the opening sentiments of this article,[288] as a reminder that not only have we come so far, we also have far to go. As eighteenth-century essayist Alexander Pope famously opined, "[f]ools rush in where Angels fear to tread."[289] An expert in the field of AI recently commented to me that we always thought when we reached this point with AI, we would understand much more about cognition than we do now. And, indeed, the gap between the state of our technology and our understanding of the technology's impact is vast. The observation is a reminder of the prophetic nature of Alexander Pope's eighteenth-century writing: "[a] little Learning is a dang'rous Thing."[290] In terms of society's relationship to the latest forms of AI, we have a lot of learning to do.

288. *See supra* notes 20–22 and accompanying text.

289. *See* ALEXANDER POPE, ESSAY ON CRITICISM 29 (Alfred S. West ed., Cambridge Univ. Press 2014) (1711).

290. *See id.*