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ARTIFICIAL INTELLIGENCE AND TRADE SECRET LAW

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ABSTRACT

This article provides a definition of artificial intelligence, a definition of trade secret law, synthesizes the two, and then offers a conclusion. The intent of this research was to determine if the unification of 'artificial intelligence and trade secret law' was a viable concept. After careful review of on-point literature, I have determined that there really is no concept of artificial intelligence and trade secret law, but instead a very viable concept of algorithms and trade secret law. This article uncovered that, in terms of trade secret law, the subcomponent of artificial intelligence – algorithms – is the only real relationship artificial intelligence has with trade secret law, at least following the current Anglo-American and even European arenas of this branch of intellectual property law. The same is not true for certain other nations, such as South Africa's, rulings on artificial intelligence and trade secret law.

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Dedication

This article is dedicated to my parents, Ralph Stephen Greer (The George Washington University Law School, Class of 1968, Order of the Coif, First in Class) and Charlotte Dudley (1934–2021).

Figure 1: My parents, Ralph Stephen Greer and Charlotte Dudley are photographed here in December 1952 on the game show Break the Bank, hosted by Bert Parks.[1]

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[*] © Gregory Gerard Greer studied the two subjects of the title of this article (artificial intelligence and trade secret law) in his first semester as a foreign lawyer in The George Washington University Law School's IP LLM (Intellectual Property Master of Law) after having graduated his British law degree at University of Wolverhampton. Mr. Greer worked as a rewriter in one of the "Big Four" Japanese Law firms in Tokyo, Japan, Nagashima Ohno & Tsunematsu (NO&T), after having been hired by Mr. Tohru Nakajima of NO&T while "GGG" (Mr. Greer's moniker at NO&T) was still working as an Assistant Language Teacher on the Japan Exchange & Teaching (JET) program in Iwaki, Fukushima, Japan. "GGG" thanks "Nakajima-sensei" for having hired him to work in Japan's largest and arguably most esteemed law firm. NO&T produced two women Japanese Supreme Court Justices, Yuko Miyazki and Eriko Watanabe – what a tribute to Japan's commitment to espousing women's rights.

[1] *Break the Bank* (NBC television broadcast Dec. 1952). Dad correctly answered the question, "What is the name of the famous financial institution in London, England, known as the 'Old Lady of Threadneedle Street?'" Answer: "The Bank of England." Mom and Dad won $200 and a year's supply of Brylcreem. *Id.*

INTRODUCTION

This article reviews and analyses the status of artificial intelligence (AI) and trade secret law, focusing on the United States (U.S.) model of trade secret law with occasional reference to non-U.S. law models of AI and trade secret law for illustrative purposes. The intent is to focus on AI and trade secret law in the U.S.

This paper is divided into four chapters and a conclusion. Chapter 1 discusses AI. Chapter 2 examines trade secret law. Chapter 3 analyses the combination of AI and trade secret law, and Chapter 4 concludes the overall discussion of AI and trade secret law.

CHAPTER 1: ARTIFICIAL INTELLIGENCE

The purpose of this article is to discuss the current relationship between AI and trade secret law, with the focus being U.S. law. What is AI? Alan Turing began the first serious work on AI in 1950, and the use of the term "AI" was credited to John McCarthy in 1956.[2] Since then, there has been no agreement on a single definition of AI.[3] Some have defined AI broadly as a "computerized system that exhibits behaviour that is commonly thought of as requiring intelligence," whereas others have defined AI as a "system capable of rationally solving complex problems or taking appropriate actions to achieve its goals in whatever real-world circumstances it encounters."[4]

More specific defining qualities have also been proffered. For example, AI has been described as a system incorporating the mastery of a combination of specific skills, such as logical reasoning, natural language processing, the ability to perceive, knowledge representation and planning.[5] Similarly, it has been defined as the successful integration of subfields such as artificial neural networks (ANN), machine learning (ML), deep learning, and robotics.[6] AI may be further defined based on the environments and situations in which it is designed to function. For instance, narrow AI, the common system currently incorporating AI, is designed to undertake specific tasks.[7]

While McCarthy did not provide a definition, "scholars Stuart Russell and Peter Norvig suggested almost ten different definitions. . . . Based on its features, AI can be defined as a system capable of performing tasks that would normally require human intelligence, such as recognition, decision-making, creation, learning, evolving,

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[2] Kay Firth-Butterfield, et al., *Artificial Intelligence Collides with Patent Law*, WORLD ECONOMIC FORUM 5 (2018), https://www3.weforum.org/docs/WEF_48540_WP_End_of_Innovation_Protecting_Patent_Law.pdf.

[3] *Id.*

[4] Nat'l Science and Tech. Council Comm. On Tech., *Preparing for the Future of Artificial Intelligence*, EXECUTIVE OFFICE OF THE PRESIDENT 6 (2016), https://obamawhitehouse.archives.gov/sites/default/files/whitehouse_files/microsites/ostp/NSTC/preparing_for_the_future_of_ai.pdf; *see also* PRADIP KUMAR SARKAR AND AMIT KUMAR JAIN, INTELLIGENT TRANSPORT SYSTEMS 278 (PHI Learning 2018).

[5] Firth-Butterfield, et al., *supra* note 2.

[6] *Id.*

[7] *Id.* However, AI with the capacity to display a wide-ranging level of intelligence approaching the abilities of the human brain is called artificial general intelligence.

and communicating."[8] However, former Splunk CEO, Doug Merritt, stated, "[a]rtificial [i]ntelligence does not exist today." [9] According to Merritt, because current AI comprises a variety of narrow forms of AI (e.g., ML, deep learning, natural language processing) that have not been integrated with one another, they have not met society's vision of true AI: "the original vision of AI … is about systems that can truly learn about anything, across any domain. [It is] what we see in movies where a machine is indistinguishable from a human."[10]

Related to neural machine translation, ANNs, the successor to machine translation, generate new ideas through collections of binary switches that replicate neurons of both human and animal brains.[11] For instance, ANNs can learn and make recommendations after being trained.[12] Thaler's Creativity Machine is an example of an ANN.[13] ANNs have also been used in drug discovery because their deep neural networks (DNN) can predict drug activities. [14] This is helpful when undertaking complex and time-intensive efforts to screen multi-target profiles, tasks that are, at times, otherwise impossible.[15] ANNs can facilitate accelerated drug discovery and development while reducing the costs associated with these processes, resulting in greater diversity, higher quality final products and better healthcare outcomes.[16]

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[8] Shlomit Yanisky-Ravid, *Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era—The Human-Like Authors are Already Here—A New Model*, MICH. ST. L. REV. 659, 673 (2017).

[9] Tom Taulli, *Splunk CEO: Artificial Intelligence Does Not Exist Today*, FORBES (Oct. 25, 2019), www.forbes.com/sites/tomtaulli/2019/10/25/splunk-ceo--artificial-intelligence-does-not-exist-today/.

[10] *Id.*

[11] Richard Nagyfi, *The Differences Between Artificial and Biological Neural Networks*, TOWARDS DATA SCIENCE (Sept. 4, 2018) https://towardsdatascience.com/the-differences-between-artificial-and-biological-neural-networks-a8b46db828b7.

[12] *See* ZHENG RONG YANG & ZIHUA YANG, ARTIFICIAL NEURAL NETWORK, COMPREHENSIVE BIOMEDICAL PHYSICS 6 (2014).

[13] Daniel Faggella, *Turning Up the Synaptic Noise to Create Machines that Dream—with Dr. Stephen Thaler*, EMERJ (Nov. 29, 2018), https://emerj.com/ai-podcast-interviews/turning-up-the-synaptic-noise-to-create-machines-that-dream-with-dr-stephen-thaler/.

[14] Yinqiu Xu, et al., *An Overview of Neural Networks for Drug Discovery and the Inputs Used*, 12 EXPERT OP. ON DRUG DISCOVERY 1091, 1091 (2018); *see also* Ingoo Lee, et al., *DeepConv-DTI: Prediction of Drug-Target Interactions via Deep Learning with Convolution on Protein Sequences*, 15 PLOS COMPUTATIONAL BIOLOGY (2019).

[15] *Id.*

[16] Erica Fraser, *Computers as Inventors—Legal and Policy Implications of Artificial Intelligence on Patent Law*, 13 SCRIPTED 305, 318 (2016).

CHAPTER 2: TRADE SECRET LAW

Vickery v. Welch was the first U.S. case on trade secret law. Therefore, the court in *Vickery* had no U.S. case law or formal statutory precedent to follow.[17] Instead, the court drew on English common law by citing *Bryson v. Whitehead*, making *Vickery* a pivotal trade secret case for American trade secret law. [18]

It was not until 1939, over 100 years after *Vickery*, that the Restatement (First) of Torts formally defined a trade secret.[19] The Restatement (First) of Torts focused on secrecy being the pivotal element, clarifying that "[t]he subject matter of a trade secret must be secret;" however, not all secrets are trade secrets.[20] Trade secrets are unique.[21] For example, they are not simply business secrets captured in everyday business activities such as secret bids on a contract, employee salaries, projected investments, dates of company events or the debut of a new product.[22]

In 1979, the Uniform Law Commission published the Uniform Trade Secrets Act (UTSA), as amended in 1985, defining what constitutes a trade secret:

> A formula, pattern, compilation, program, device, method, technique, or process, that: (i) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and (ii) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.[23]

Inventions (i.e., patent-worthy items) are protectable as trade secrets because the UTSA definition specifies that a trade secret can be a "program, device, [or] method."[24] Comparable to other uniform laws (e.g., state laws), the UTSA provided states with a complete "legislative approach to a particular legal issue" that could be

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[17] Vickery v. Welch, 36 Mass. 523, 527 (1837); *see also* Sharon 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, 500 (2010).

[18] Bryson v. Whitehead, 57 ER 29 (1822). It was contended for the defendant, that this obligation was void as being in restraint of trade. But we cannot suppose that the case comes within that doctrine. *Id.*

[19] Restatement (First) of Torts § 757 cmt. b (1939).

[20] *Id.*

[21] Gabriel S. Gross, et al., *5 Things to Know About the Defend Trade Secrets Act*, LATHAM & WATKINS (Apr. 18, 2016), https://www.lw.com/thoughtLeadership/5-things-about-the-defend-trade-secrets-act-of-2016.

[22] Russell Beck, *Trade Secrets Law—A Primer*, FAIR COMPETITION LAW (Apr. 3, 2016), https://faircompetitionlaw.com/2016/04/03/trade-secrets-law-a-primer/. The Restatement (First) of Torts, *supra* note 19, stated that:

> [a] trade secret may consist of any formula, pattern, device, or compilation of information which is used in one's business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it. It may be a formula for a chemical compound, a process of manufacturing, treating or preserving materials, a pattern for a machine or other device, or a list of customers.

[23] Unif. Trade Secrets Act (1985); *id.*

[24] *Id.*

standardized state-by-state—that is, states could adopt the Act at liberty.[25] For example, New York, which is considered an "important jurisdiction," chose not to adopt the Act.[26]

North Carolina is the only state not to adopt the UTSA.[27] However, the North Carolina Trade Secrets Protection Act is comparable to the UTSA.[28] It is evident that trade secret law is state-specific; therefore, there are considerable deviations between states.[29] Generally, most states have opted to adopt a variation of the UTSA.[30] For example, the California and Wisconsin UTSAs define a trade secret differently:[31]

> 'Trade secret' means information, including a formula, pattern, compilation, program, device, method, technique, or process, that:
>> (1) Derives independent economic value, actual or potential, from not being generally known to the public or to other persons who can obtain economic value from its disclosure or use; and
>> (2) Is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.[32]

> 'Trade secret' means information, including a formula, pattern, compilation, program, device, method, technique or process to which all of the following apply:
>> 1. The information derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use.
>> 2. The information is the subject of efforts to maintain its secrecy that are reasonable under the circumstances.[33]

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[25] George C Summerfield, et al., *Trade Secret Protection for AI Inventions*, STARTUP-TOGETHER (June 21, 2019), http://startup-together.com/startup-together-com-contributions/trade-secrect-protection-for-artificial-intelligence-inventions-part-1-of-2/.

[26] *Id.*

[27] Beck Reed Riden, LLP, *Trade Secrets Laws and the UTSA: 50 State and Federal Law Survey*, BRR (Jan. 24, 2017) https://beckreedriden.com/trade-secrets-laws-and-the-utsa-a-50-state-and-federal-law-survey-chart/; Digital Media Law Project, *Trade Secrets Law in North Carolina*, DMLP (Sept. 10, 2021) www.dmlp.org/legal-guide/north-carolina/trade-secrets-law-north-carolina; Unif. Trade Secrets Act, *supra* note 23.

[28] N.C. Gen. Stat. § 66-152 (2022).

[29] Summerfield, et al., *supra* note 25; Beck Reed Riden, LLP, *supra* note 27; Digital Media Law Project, *supra* note 27; Unif. Trade Secrets Act, *supra* note 23.

[30] Beck Reed Riden, LLP, *supra* note 27.

[31] Fenwick & West, LLP, *Trade Secrets Protection: A Primer and Desk Reference for Managers and In House Counsel*, FENWICK & WEST, LLP (2001) https://assets.fenwick.com/legacy/FenwickDocuments/Trade_Secrets_Protection.pdf.

[32] Ca. Civ. Code § 3426.1(d) (1984) (this version of the statute was used to show the importance "readily ascertainable" plays in trade secret law).

[33] Wis. Stat. § 134.90(1)(c) (2011) (this version of the statute was used to show the difference between using "readily ascertainable" in a state statute, and not using the phrase in one).

California and Wisconsin provide examples of differences regarding what constitutes a trade secret. It can be noted that California removed "readily ascertainable" from its trade secret definition while Wisconsin retained "readily ascertainable" from the UTSA definition.[34] While some may consider this difference trivial, "readily ascertainable" changes the meaning completely. California consciously removed the words "readily ascertainable" from its trade secret law.[35] Therefore, something not readily ascertainable (i.e., known and not necessarily a secret) under California law can be considered a trade secret.[36]

On the federal level, multiple acts are in place to guard trade secrets. The Economic Espionage Act of 1996 (EEA) enables criminal prosecution and civil claims by the U.S. attorney general for stolen trade secrets.[37] Trade secret law received an enhancement with the enactment of the EEA, codified in inserting 18 USC §§ 1831-39.[38] The EEA made theft or misappropriation of a trade secret a federal crime.[39] Particularly, 18 USC § 1831(a) criminalizes the theft of trade secrets to benefit foreign powers, and 18 USC § 1832 criminalizes trade secret theft for commercial or economic purposes. Further, the Computer Fraud and Abuse Act of 1986 "provides protection against the wrongful access to electronically-stored information, regardless of whether or not such information qualifies as a trade secret."[40]

It was not until 2016 that civil redress was added to the EEA by the Defend Trade Secrets Act of 2016 (DTSA), which creates a private right cause of action for misappropriation, enabling trade secret owners to file suit in federal court when they believe their trade secrets have been misappropriated.[41] The DTSA created a uniform federal statutory regime, enabling the replacement of the disparate state-based system of trade secret law (i.e., the UTSA and the states' deviations or additions to it); however, the DTSA was specifically designed not to pre-empt existing states' trade secret laws.[42] Under the DTSA, 18 USC § 1839(3)(B), a secret only needs to have

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[34] Ca. Civ. Code, *supra* note 32; *id*.

[35] Ca. Civ. Code, *supra* note 32.

[36] *Id*.

[37] 18 U.S.C. §§ 1831-1839 (2022).

[38] *Id*.

[39] *Id*.

[40] Computer Fraud and Abuse Act of 1986, Pub. L. No. 99-474, 100 Stat. 1213 (amending Fraud and related activity in connection with computers, 18 U.S.C. § 1030 (1984)); *see also* 18 U.S.C. § 1831 (2022).

[41] Defend Trade Secrets Act of 2016, Pub, L. 114–153, 130 Stat. 376 (2016) (amending 18 U.S.C. § 1836); Jason B Freeman, *The Economic Espionage Act: Key Provisions*, FREEMAN LAW (2022), https://freemanlaw.com/economic-espionage/.

[42] 18 U.S.C. § 1838 (2022):

> Except as provided in section 1833(b), this chapter shall not be construed to preempt or displace any other remedies, whether civil or criminal, provided by [US] Federal, State, commonwealth, possession, or territory law for the misappropriation of a trade secret, or to affect the otherwise lawful disclosure of information by any Government employee under section 552 of title 5 (commonly known as the Freedom of Information Act).

"actual or potential" value derived from the secret.[43] Whether pursuing a state or a federal claim, misappropriation is part and parcel of trade secret law.[44]

In the spirit of the UTSA, in *Ruckelshaus v. Monsanto Co.*, the Supreme Court held that trade secrets are property rights if maintained as property.[45] In effect, the Supreme Court removed trade secret theft or misappropriation from tort law, eliminating the tort requirement of showing a specific duty owed to the owner.[46] While trade secrets as property are transferrable, if the secret is made public during the transfer, the trade secret is extinguished, unlike patent law, where public disclosure is mandatory.[47] Thus, trade secrets are unlike patents insofar as public disclosure eliminates the existence of the trade secret.[48]

Despite its various iterations, U.S. trade secret law is arguably more advanced than in other nations.[49] For example, the European Union (EU) issued Council

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[43] 18 U.S.C. § 1839(2) (2022). The DTSA defines a trade secret as:

> all forms and types of financial, business, scientific, technical, economic, or engineering information, including patterns, plans, compilations, program devices, formulas, designs, prototypes, methods, techniques, processes, procedures, programs, or codes, whether tangible or intangible, and whether or how stored, compiled, or memorialized physically, electronically, graphically, photographically, or in writing if—
>
> (A) the owner thereof has taken reasonable measures to keep such information secret; and
> (B) 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.

[44] Scott McDonald & Jackie Johnson, *Trade Secrets Finally Get Federal Law Protection*, LITTLER MENDELSON (May 2, 2016), https://www.littler.com/publication-press/publication/trade-secrets-finally-get-federal-law-protection.

[45] Ruckleshaus v. Monsanto Co., 467 U.S. 986, 1003–4 (1984).

[46] *Id.*

[47] *Id.* at 1002. The Supreme Court has held that a person can have a property interest in a trade secret (protected by the Taking Clause of the Fifth Amendment), although "[b]ecause of the intangible nature of a trade secret, the extent of the property right therein is defined by the extent to which the owner of the secret protects his interest from disclosure to others"; Brian T. Yeh, *Protection of Trade Secrets: Overview of Current Law and Legislation*, CONGRESSIONAL RESEARCH SERVICE (2016), https://sgp.fas.org/crs/secrecy/R43714.pdf; Camilla A Hrdy & Mark A Lemley, *Abandoning Trade Secrets*, 73 STAN. L. R. 1, 20 (2021); *see also* Cincinnati Bell Foundry Co. v. Dodds, 10 Ohio Dec. Reprint 154, 154–6 (Super. Ct. 1887) (accepting the principle that a trade secret can be transferred like property from one business to another); Holland & Knight, *Reference Your Trade Secret in the Terms of Use to Make it Protectable*, HOLLAND & KNIGHT: DIGITAL TECHNOLOGY & E-COMMERCE BLOG (Feb. 28, 2018) https://www.hklaw.com/en/insights/publications/2018/02/reference-your-trade-secret-in-the-terms-of-use-to; Jason Rantanen, *Patent Law's Disclosure Requirement*, 45 LOY. UNIV. CHI. L. J. 369, 371 (2013).

[48] Steven R Daniels & Sharaè L Williams, *So You Want to Take a Trade Secret to a Patent Fight? Managing the Conflicts between Patents and Trade Secret Rights*, ABA (Aug. 5, 2019), https://www.americanbar.org/groups/intellectual_property_law/publications/landslide/2018-19/july-august/so-you-want-take-trade-secret-patent-fight/.

[49] Yeh, *supra* note 47, at 11:

> Much of the rest of the world has very weak laws or enforcement practices, with the issue particularly acute in many of the largest emerging economies, such as China, Brazil, Russia, and India. Thus, as supply chains and operations expand globally, a company's ability to protect its trade secrets may be significantly diminished by

Directive 2016/943 of the European Parliament and of the Council of June 8, 2016 on the protection of undisclosed know-how and business information (trade secrets) against their unlawful acquisition, use, and disclosure.[50] Prior to the issuance of this EU directive, EU member states had insubstantial trade secret regimens, which defined the Anglo-American law concept of trade secrets:

> (a) it is secret in the sense that it is not, as a body or in the precise configuration and assembly of its components, generally known among or readily accessible to persons within the circles that normally deal with the kind of information in question;
> (b) it has commercial value because it is secret;
> I it has been subject to reasonable steps under the circumstances, by the person lawfully in control of the information, to keep it secret. [51]

The U.S. applies its trade secrets laws regarding foreign matters through the International Trade Commission. For example:

> [i]n *TianRui Grp. Co. v Int'l Trade Comm'n*, the [U.S.] Court of Appeals for the Federal Circuit affirmed an [International Trade Commission] determination to apply [U.S.] trade secret law to exclude articles from importation that incorporated trade secret information that had been misappropriated in China. Thus, a trade secret owner can protect its domestic market even where trade secret misappropriation has occurred overseas.[52]

Further, on an international level, trade secrets are protected by Article 39 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).[53] "The TRIPS Agreement, which came into effect on January 1, 1995, is to date the most comprehensive multilateral agreement on intellectual property." [54] TRIPS covers copyright and related rights, trademarks including service marks, geographical indications, industrial designs, patents, the layout-designs of integrated circuits, and

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weak rule of law and ineffective or non-existent enforcement in a number of countries.

[50] Council Directive 2016/943, art. I, 2016 O.J. (L 157/1). Note that this parallels Article 39 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).

[51] Rodolphe Baron and Martin Pigeon, *Adapting the EU Directive on Trade Secrets "Protection" into National Law: A Transposition Guide for Legislators and Civil Society Organisations*, CORPORATE EUROPE OBSERVATORY (2017),
https://corporateeurope.org/sites/default/files/attachments/trade_secrets_protection_directive_-_a_transposition_briefing.pdf.

[52] Summerfield, et al., *supra* note 25.

[53] World Trade Organization, *Overview: The TRIPS Agreement*, WTO (2022), https://www.wto.org/english/tratop_e/trips_e/intel2_e.htm#:~:text=The%20TRIPS%20Agreement%20is%20a,own%20legal%20system%20and%20practice.

[54] *Id.*

undisclosed information.[55] Although the term "trade secret" is not used, TRIPS protects "undisclosed information," which is described similarly to trade secrets.[56] While AI is generally well known, the same cannot be said for trade secret law. Trade secrets are not just the Coca-Cola formula, or the KFC recipe buried away in a safe at company headquarters or a secure safe.[57] Trade secret law is a complicated subject both domestically and globally. Chapter 3 will focus on combining AI and trade secret law while demonstrating that the term "AI and trade secret law" is a misnomer.

CHAPTER 3: ARTIFICIAL INTELLIGENCE AND TRADE SECRET LAW

When it comes to AI and trade secret law, one must explore the components of AI. It is reasonable to assume that the idea of an overall AI system is easily recognizable (e.g., a robot); however, this alone is not what makes up AI. Therefore, it is necessary to define the broader and more specific components of AI, looking at the 'forest' and the 'trees' of AI. The 'forest' is an AI system (e.g., an aggregate fixed item that could be patented – the 'forest'), and the 'trees' are the integral element of all AI, algorithms.[58]

The U.S. Patent and Trademark Office (USPTO) has reserved Class 706 for AI patents.[59] It should be noted that while "computers, systems, methods, and product" are recognized for patent protection, "systems" are the issue.[60] A visual of the Class 706 webpage proves that "system" is the integral element of AI in respect of patentability (see Figure 2). [61]

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[55] *Id.* This includes coverage of "copyright and related rights (i.e., the rights of performers, producers of sound recordings and broadcasting organizations)" and "patents including the protection of new varieties of plants; the layout-designs of integrated circuits; and undisclosed information including trade secrets and test data."

[56] *Id.*; *see also* Summerfield, et al., *supra* note 25.

[57] Vrushali Padia, *The Secret Spice: 7 Heavily Guarded Billion Dollar Recipes*, THE RICHEST (Oct. 20, 2021) https://www.therichest.com/rich-powerful/the-secret-spice-7-heavily-guarded-billion-dollar-recipes/.

[58] Roy Lindelauf, *Nuclear Deterrence in the Algorithmic Age: Game Theory Revisited*, NL ARMS ANN. REV. OF MIL. STUD. 421 (2020), https://link.springer.com/content/pdf/10.1007/978-94-6265-419-8.pdf.

[59] Classification Definitions, *Class 706, Data Processing - Artificial Intelligence*, USPTO (2011), https://www.uspto.gov/web/patents/classification/uspc706/defs706.pdf.

> This is a generic class for [AI-type] computers and digital data processing systems and corresponding data processing methods and products for emulation of intelligence (i.e., knowledge-based systems, reasoning systems, and knowledge acquisition systems); and including systems for reasoning with uncertainty (e.g., fuzzy logic systems), adaptive systems, [ML] systems, and [ANN].

[60] *Id.*

[61] *Id.*
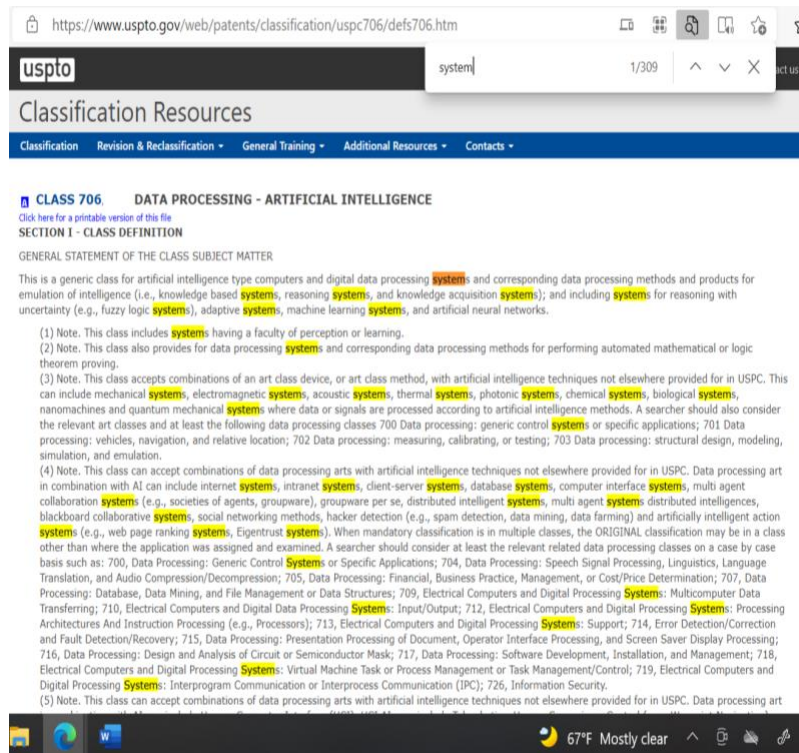
Figure 2: Screenshot from the United States Patent and Trademark Office Class 706 Webpage[62]

The word "system" appears 309 times on the USPTO webpage.[63] A system may be needed for AI patentability, and the system applied may be broader AI, but the algorithms are the more specific components that form the AI. [64] Arguably, algorithms could be called the 'trees' making up the system (the 'forest') of patentable AI. Further, it is apparent from a broad literature review and the common use of the word "algorithmic" that the two terms, algorithmic and artificial intelligence, are frequently used interchangeably.[65]

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[62] *Id.*

[63] *Id.*

[64] Quinyx, *What's the Difference between AI, ML, and Algorithms?*, QUINYX (2022), https://www.quinyx.com/blog/difference-between-ai-ml-algorithms#:~:text=To%20summarize%3A%20algorithms%20are%20automated,receive%20is%20structured%20or%20unstructured..

[65] Robert Brauneis & Ellen P. Goodman, *Algorithmic Transparency for the Smart City*, 20 YALE J. L. & TECH. 103 (2018). That is, "AI" meaning "algorithms/algorithmic" and vice versa. *See also* Philip Sales, *Algorithms, Artificial Intelligence, and the Law*, JUDICATURE 22 (2021), https://judicature.duke.edu/wp-content/uploads/2021/04/Sales_Spring2021.pdf; Priya Pedamkar, *Artificial Intelligence Algorithm*, EDUCBA (2022) https://www.educba.com/artificial-intelligence-algorithm/.

Algorithms introduce the "complex interplay between patent law and trade secret law."[66] Some argue that patent law and trade secret law are mutually exclusive internet property (IP) rights, while others argue they are not.[67] According to 35 U.S.C. §101, a patentable subject matter is defined as "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof."[68] However, in *Assoc. for Molecular Pathology v. Myriad Genetics, Inc.*, the Supreme Court ruled that "[l]aws of nature, natural phenomena, and abstract ideas are not patentable."[69] Algorithms, the more specific components (or 'trees') of AI, are wholly abstract and, therefore, per se, are not patentable, as was described in *Alice Corp. Pty Ltd. V. CLS Bank Int'l.*[70] From this pivotal case came the *Alice* doctrine, which declares that abstract ideas are not patentable.[71] *Alice* held that "known ideas are abstract, and reciting the use of a conventional computer in the claims to implement the known idea does not make the claim patentable subject matter."[72]

This is the status quo of patent law and AI in 2022. Patent law is clearly not a friend of algorithms. Virtually no U.S. patents have been issued for purely algorithmic patent applications.[73] It should be reiterated that AI has been issued for overall <u>systems</u>, as indicated in Figure 2.[74] Algorithms alone will not pass the patent process based on the crystal-clear requirement as indicated 309 times on the USPTO Class 706 webpage.[75]

In *Kewanee Oil Company v. Bicron Corporation*, the Supreme Court declared that trade secret law was far weaker than patent law.[76] According to 18 U.S.C. § 1839(3)(B) of the DTSA, a trade secret need only have "actual or potential" value derived from the secret to be deemed a trade secret.[77] Therefore, with federal statutory backing, trade secret law covers a wider range of items, including algorithms (i.e., the abstract, non-patentable component integral to AI).[78]

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[66] Omid Khalifeh, *Do Patents or Trade Secrets Better Product Artificial Intelligence*, OMNI LEGAL GROUP (Sept. 1, 2021), www.omnilegalgroup.com/blog/patents-trade-secrets-artificial-intelligence/.

[67] Patent- und Rechtsanwaltskanzlei, *Trade secret or patent? Comparison for IP protection*, LEGAL-PATENT (Oct. 5, 2020), https://legal-patent.com/patent-law/trade-secret-or-patent-comparison-for-ip-protection/; *see also* Intellectual Property Practice Group, *Patents and Trade Secrets Aren't Mutually Exclusive: The Nuanced Nature of Trade Secret Protection*, THE NAT'L L. REV. (2021), www.natlawreview.com/article/patents-and-trade-secrets-aren-t-mutually-exclusive-nuanced-nature-trade-secret.

[68] 35 U.S.C. § 101 (2022).

[69] Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576, 589 (2013).

[70] Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208, 212 (2014).

[71] Joseph Saltiel, *In the Courts: Five Years after Alice - Five Lessons Learned from the Treatment of Software Patents in Litigation*, WIPO MAGAZINE (Aug. 2019) https://www.wipo.int/wipo_magazine/en/2019/04/article_0006.html.

[72] *Id.*

[73] USPTO, *supra* note 59.

[74] *Id.*

[75] *Id.*

[76] Kewanee Oil Co. v Bicron Corp., 416 U.S. 470, 489–90 (1974).

[77] 18 U.S.C. § 1839(3)(B) (2022).

[78] Michael J. Kasdan, et al., *Trade Secrets: What You Need to Know*, THE NAT'L L. REV. (2019), https://www.natlawreview.com/article/trade-secrets-what-you-need-to-know; *see also* JAMES BOYLE AND JENNIFER JENKINS, INTELLECTUAL PROPERTY: LAW & THE INFORMATION SOCIETY—CASES & MATERIALS 783 (5th ed.):

In today's algorithmic world, trade secrets are the best form of intellectual property protection for algorithms.[79] This is particularly true because "[e]ven the smallest of [AI] designs need basic instructions in order to function. And that's where algorithms come into the overall process." [80] However, because algorithms are mathematical instructions, they are ineligible for patent and copyright protections.[81] Therefore, trade secret law is the only option for algorithms, and secrecy is the only way to keep others from using your created algorithms.[82]

Trade secret law's greatest drawback is the lack of trade secret law violation when someone independently discovers or reverse-engineers the same algorithms and uses them for their own purposes.[83] However, this is not an end-all for AI. While the Eighth Circuit held that an algorithm could be copyrightable, the scope of copyright protection is limited to instructions only, not the algorithms.[84] Again, algorithms are not copyrightable; only "data that is created rather than collected is copyrightable if [the] creative judgment goes into each datum."[85]

It appears that trade secret law is the only true protector of algorithms.[86] Further, unlike patent or copyright protection, trade secret protection can be obtained without application or registration.[87] According to the World Intellectual Property Organization (WIPO), unlike patents, trade secret protection is automatic if the owner

> Trade secret law provides far weaker protection in many respects than the patent law. While trade secret law does not forbid the discovery of the trade secret by fair and honest means, e.g., independent creation or reverse engineering, patent law operates 'against the world', forbidding any use of the invention for whatever purpose for a significant length of time. The holder of a trade secret also takes a substantial risk that the secret will be passed on to his competitors, by theft or by breach of a confidential relationship, in a manner not easily susceptible [to] discovery or proof. Where patent law acts as a barrier, trade secret law functions relatively as a sieve.

[79] 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. L. & PRAC. 247 (2021).

[80] Rock Content Writer, *Artificial Intelligence Algorithm: Everything You Need to Know About It*, ROCK CONTENT BLOG (June 28, 2021) https://rockcontent.com/blog/artificial-intelligence-algorithm/.

[81] *Id.*

[82] *Id.*

[83] *Id.*

[84] David Rabinowitz, *As Artificial Intelligence Expands, so do Legal Protections*, BLOOMBERG LAW (Aug. 20, 2021), https://news.bloomberglaw.com/privacy-and-data-security/as-artificial-intelligence-expands-so-do-legal-protections.

[85] *Id.*

[86] *Id.*

[87] WIPO, *Frequently Asked Questions: Trade Secrets Basics: How are Trade Secrets Protected?*, WIPO https://www.wipo.int/tradesecrets/en/tradesecrets_faqs.html#:~:text=Contrary%20to%20patents%2C%20trade%20secrets,and%20disclosed%20to%20the%20public (last visited July 13, 2022).

takes certain steps to ensure the trade secret is treated as a trade secret and if there is a commercial advantage associated with the trade secret.[88]

The issue with trade secrets is keeping the secret a secret. Trade secret protection lasts so long as the information is kept secret, unless legally discovered by another entity, including independent discovery or reverse-engineering. [89] While independent development is a defense to trade secret misappropriation, the same cannot be said for patent infringement.[90]

Turning to protecting and maintaining trade secrets, WIPO PROOF is a tool for preserving the confidentiality of company information.[91] WIPO PROOF uses a special digital encryption system that digitally fingerprints confidential information within internal storage.[92] The stamp is encrypted, cannot be altered, and can be used as evidence in court that confidential information existed at a specific time.[93] While this is a good solution for single documents, the same cannot be said for big data and algorithms.[94]

Today, when almost everything is becoming digitalized, a zero-trust approach is a prevailing option for big data.[95] With zero-trust, "[as] soon as an algorithm is conceived, a company could consider it a trade secret and take reasonable steps to keep it a secret."[96] This means "knowing about it would be limited to a certain number of people, or employees with access to it … sign[ing] a confidentiality agreement."[97] Further, "[n]obody would be permitted to take the algorithm home overnight, and it must be kept in a safe place."[98] While perhaps common sense, it is necessary to spell this out because, legally, this could be mandatory if a company wishes to prevail in court in proving a legitimate trade secret.[99]

In the world of information technology, it has been suggested that "best practices for protecting algorithms are rooted in the principles of a zero-trust approach."[100] Because of this, "[a]algorithms deemed trade secrets should be stored in

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[88] WIPO, *Summary of the Convention Establishing the World Intellectual Property Organization (WIPO Convention) (1967)*, WIPO www.wipo.int/treaties/en/convention/summary_wipo_convention.html (last visited Oct. 11, 2021); (stating WIPO is literally the United Nations of worldwide IP matters); WIPO, *Obtaining IP Rights: Trade Secrets*, WIPO www.wipo.int/sme/en/obtain_ip_rights/trade_secrets.html (last visited Oct. 11, 2021).

[89] Kasdan, et al., *supra* note 78.

[90] Daniels & Williams, *supra* note 48.

[91] WIPO, *WIPO PROOF – Trusted Digital Evidence*, WIPO www.wipo.int/wipoproof/en/ (last visited Sept. 27, 2021).

[92] *Id.*

[93] *Id.*

[94] David A Prange & Robins Kaplan, *Navigating the Protection of Big Data*, INTELL. PROP. MAG. (Dec. 7, 2016), https://www.intellectualpropertymagazine.com/patent/navigating-the-protection-of-big-data-121248.htm. That is, a large volume of generated data for analysis at a rapid velocity consisting of various formats in which the data is available.

[95] Stacy Collett, *How to Protect Algorithms as Intellectual Property*, CSO (July 13, 2020), www.csoonline.com/article/3565195/how-to-protect-algorithms-as-intellectual-property.html.

[96] *Id.*

[97] *Id.*

[98] *Id.*

[99] *Id.*

[100] Collet, *supra* note 95.

a virtual vault." [101] This would mean "[t]he least [number] of users … [being] granted access to the vault with the least [number] of privileges required to do their job."[102] As a precaution, "[a]access to the vault should require a second factor of authentication and all access and use should be logged and monitored."[103] This almost conjures up images of using the nuclear launch codes on a nuclear submarine.[104]

While proof of ownership of company-created algorithms is essential in any trade secret lawsuit, proving ownership can be cumbersome since possession is nine-tenths of the law.[105] For instance, spear phishing is a commonly observed attack.[106] Further, to prevent theft or sabotage, IBM and other companies have been working together to help prove ownership of an algorithm by developing ways to embed digital watermarks into the DNN in AI, like the multimedia concept of watermarking digital images.[107] IBM's method was unveiled in 2018 and allows applications to verify the ownership of neural network services with API queries, which is essential to protect against attacks that might, for instance, fool an algorithm in an autonomous car to drive past a stop sign.[108] Moreover, researchers at KDDI Research and the National Institute of Informatics introduced a method of watermarking deep learning models in 2017.[109] However, the current problem with watermarking solutions is the inability to guard against piracy attacks when infringers claim ownership after embedding their own watermarks.[110]

Researchers at The University of Chicago have unveiled null embedding to combat this issue, which can build piracy-resistant watermarks into DNN at a model's initial training.[111] "A null embedding takes a bit string (watermark value) as input,

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[101] *Id.*

[102] *Id.*

[103] *Id.*

[104] Christopher Thomas, *Power & Conflict: Crimson Tide*, YOUTUBE (Dec. 16, 2017), www.youtube.com/watch?v=GB2SDmV9oDs.

[105] Howard Ullman, *Trade Secret Ownership: Possession is Nine-Tenths of the Law*, TRADE SECRETS WATCH (May 11, 2020) https://blogs.orrick.com/trade-secrets-watch/2020/05/11/trade-secret-ownership-possession-is-nine-tenths-of-the-law/.

[106] Collett, *supra* note 95:

> [S]pear-phishing [are] attacks to steal developer credentials via bogus login and password reset pages to gain access to the systems that store such [trade secrets] … [and it is] hard to protect against someone with the intention of taking an algorithm or process … You can have all kinds of restrictions, but if someone has the intent, they're going to do it—but that doesn't mean you don't do anything.

See also Dan Swinhoe, *What is Spear Phishing? Why Targeted Email Attacks are so Difficult to Stop*, CSO (Jan. 21, 2019), www.csoonline.com/article/3334617/what-is-spear-phishing-why-targeted-email-attacks-are-so-difficult-to-stop.html. "A highly targeted form of phishing, spear phishing involves bespoke emails being sent to well-researched victims. It is hard to spot without close inspection and difficult to stop with technical controls alone." *Id.*

[107] IBM Research Editorial Staff, *Protecting the Intellectual Property of AI with Watermarking*, IBM (July 20, 2018) https://www.ibm.com/blogs/research/2018/07/ai-watermarking/.

[108] *Id.*

[109] ResearchGate, *Yuki Nagai's Research while Affiliated with KDDI Research and Other Places*, RESEARCHGATE https://www.researchgate.net/scientific-contributions/Yuki-Nagai-2162919271 (last visited July 13, 2022).

[110] *Id.*

[111] Huiying Li, et al., *Persistent and Unforgeable Watermarks for Deep Neural Networks*, UNIVERSITY OF CHICAGO (2019), http://web.stanford.edu/class/ee380/Abstracts/191030-paper.pdf.

and builds strong dependencies between the model's normal classification accuracy and the watermark."[112] This results in attackers being unable to remove an embedded watermark or add a new pirate watermark to an already watermarked model.[113]

These technical machinations give the impression that algorithms and trade secret law are an endless cat-and-mouse game. It has been suggested that laws be changed to recognize algorithms as eligible for patents.[114] In the U.S., this would mean eliminating the *Alice* doctrine.[115]

It has been suggested that "the IP sector should accept … the current use of trade secrecy law to protect companies."[116] AI work is a "bad" solution, creating a dangerous lack of transparency and accountability.[117] Copyright protection would offer a better but "ugly" solution, allowing systems to be studied and subject to compulsory licenses if necessary. However, this would place technical systems under a framework designed for "creative" works. [118] Broadening the scope of patent protection to incorporate algorithms, algorithmic models and their bespoke datasets would help with the transparency of systems by making aspects of their functionality public and granting greater insight into which systems exist.[119] In the current battle of our "good, bad and ugly," patents are the only "good" solution. They should be embraced as such.[120]

For patent protection of AI and its algorithms to occur in the US, either the Supreme Court or Congress would have to overturn the famous *Alice* doctrine. This may be possible following the *Paulsen-Whelan* approach where the branches of the U.S. Government are not necessarily bound by the U.S. Courts.[121] For the time being, the *Alice* doctrine has established trade secret law as the only viable IP protection for algorithms.[122] AI systems might enjoy patent protection, but the algorithms that make up an AI system do not.[123] Trade secret protection rules the day for algorithms.

Moving beyond AI and trade secret law in the traditional sense (i.e., companies protecting their secrets and seeking redress in the courts), there has been great concern in recent years outside the courts and within the arena of law

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[112] *Id.*

[113] *Id.*

[114] *Id.*; Foss-Solbrekk, *supra* note 79.

[115] *Alice Corp. Pty. Ltd.*, 573 U.S. at 212.

[116] Li, et al., *supra* note 111; Foss-Solbrekk *supra* note 79.

[117] *Id.*

[118] *Id.*

[119] *See* Li, et al., *supra* note 111; Summerfield, et al., *supra* note 25.

[120] MGM, *The Good, the Bad, and the Ugly (1966) | Official Trailer | MGM Studios*, YOUTUBE (Jan. 11, 2021), www.youtube.com/watch?v=IFNUGzCOQoI. The analogy with the famous 1966 spaghetti Western film is excellent. In that film, there was a protected secret (the location of a graveyard and a name on a tombstone) that one needed to locate the treasure buried therein. *Id. See also* Foss-Solbrekk, *supra* note 79, at 258.

[121] Damon Root, *Can the President Lawfully Ignore a Supreme Court Decision?*, REASON (Apr. 6, 2015), https://reason.com/2015/06/04/can-the-president-lawfully-ignore-a-supr/.

[122] Meghan J Ryan, *Secret Algorithms, IP Rights, and the Public Interest*, 21 NEV. L.J. 61, 64 (2020). "The incentive for secrecy that *Alice* created has fueled an additional troubling development in the domain of the public interest."

[123] Aarti Shah, et al., *U.S. District Court Holds that AI Algorithms Cannot be Listed as Inventors on Patents*, IP WATCHDOG (Sept. 7, 2021), https://www.ipwatchdog.com/2021/09/07/us-district-court-holds-ai-algorithms-cannot-listed-inventors-patents/id=137350/.

enforcement regarding the overreaching of big companies.[124] This is a parallel issue of trade secret law from a public policy perspective: privacy and transparency. Ongoing privacy and transparency concerns have led to the introduction of the Algorithmic Justice and Online Platform Transparency Act of 2021 (the Bill).[125] This Bill is aimed at "prohibit[ing] the discriminatory use of personal information by online platforms in any algorithmic process, to require transparency in the use of algorithmic processes and content moderation, and for other purposes."[126]

The proposed Bill has multiple goals. It aims to prohibit algorithmic processes on online platforms from discriminating based on race, age, gender, ability, and other protected characteristics.[127] Moreover, it seeks to establish a safety and effectiveness standard for algorithms so that online platforms may not employ automated processes that harm users or fail to take reasonable steps to ensure algorithms achieve their intended purposes.[128] The Bill requires online platforms to describe to users in plain language the types of algorithmic processes employed and the information they collect to utilize those processes.[129] Finally, it requires that online platforms maintain detailed records describing their algorithmic process for review by the Federal Trade Commission in compliance with key privacy and data de-identification standards.[130]

Currently, algorithms that increase and decrease the visibility of online content on social media platforms are acting as black boxes, making regulatory oversight difficult.[131] For example, it was uncovered that Facebook failed to abide by its commitment to stop using its algorithms to recommend political groups to users ahead of the 2020 election, and that they similarly failed to take down dangerous conspiracy theorist content that was previously banned.[132] Algorithmic processes are used by the public every day, and often, "unbeknownst to members of the public," are used in discriminatory manners.[133] The increasing use of AI tools poses harm to marginalized communities and warrants a comprehensive review of these technologies and their potential for discriminatory outcomes.[134]

In the area of trade secret law, it is arguably erroneous to declare that AI and trade secret law is an overarching category—simply saying "AI and trade secret law"

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[124] Walter Frick, *The Conundrum of Corporate Power*, HARV. BUS. REV. (May–June 2018), https://hbr.org/2018/05/the-conundrum-of-corporate-power.

[125] H.R. 3611, 117th Cong. (2021-22) (as of writing this article, this Bill has not yet been passed by Congress).

[126] *Id.*

[127] *Id.*

[128] *Id.*

[129] *Id.*

[130] H.R. 3611, *supra* note 125. The Bill would require online platforms to publish annual public reports detailing their content moderation practices. It would also create an inter-agency task force comprised of entities, including the Federal Trade Commission, U.S. Department of Education, U.S. Department of Housing and Urban Development, U.S. Department of Commerce and U.S. Department of Justice, to investigate the discriminatory algorithmic processes employed in sectors across the economy. *Id. See also* Ed Markey, *Senator Markey, Rep. Matsui Introduce Legislation to Combat Harmful Algorithms and Create New Online Transparency Regime*, ED MARKEY (May 27, 2021), https://www.markey.senate.gov/news/press-releases/senator-markey-rep-matsui-introduce-legislation-to-combat-harmful-algorithms-and-create-new-online-transparency-regime.

[131] Markey, *supra* note 130.

[132] *Id.*

[133] *Id.*

[134] *Id.*

is a misnomer. Further, there is no defensible argument for using the term "AI and trade secret law" because the concept was effectively voided by the *Alice* doctrine, where the Supreme Court ruled that algorithms per se are not patentable.[135] While an AI system could be retained as a trade secret, any company with such a patent-worthy system would likely prefer the monopoly that patent law offers. However, trade secret law does not offer any monopolies and only offers redress in the courts upon proof of misappropriation. Therefore, the correct term is "algorithms and trade secret law."

CHAPTER 4: CONCLUSION

This article aimed to uncover the relationship between AI and trade secret law within U.S. intellectual property law. Based on the current situation of U.S. intellectual property law, there is no concept of the term "AI and trade secret law." The correct term for an AI relationship with trade secret law is "algorithms and trade secret law."

While AI systems can be protected as trade secrets, one may question why a company would not try to patent AI for a time-limited monopoly of the system.[136] That seems to defy common IP business practice. Theoretically, an AI system could be nestled away as a secret forever; however, the likelihood of this seems unlikely. Protecting a true AI system is not as simple as hiding away Colonel Sanders' eleven herbs and spices in the corporate vault.[137] The sheer volume of a functioning AI system in 2022 demands massive storage capabilities well into the multi-terabyte or even exabyte level of storage (i.e., big data).[138] With such large storage requirements and an operation of such an expansive storage system, keeping the system secret becomes increasingly difficult.[139]

While complicated, the development of an AI system often ends in a simple result that could be reverse-engineered by others.[140] For example, Philyra, an AI product composition system, "uses new, advanced [ML] algorithms to sift through hundreds of thousands of formulas and thousands of raw materials [to help] identify patterns and novel combinations [of perfume fragrances]."[141] The algorithms used in conjunction with the "[o]lfactory actuators and other hardware can be utilized to

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[135] Markey, *supra* note 130; *see also Alice*, 573 U.S. at 226.

[136] Jessica M Meyers, *Artificial Intelligence and Trade Secrets*, LANDSLIDE (Feb. 2019), https://www.americanbar.org/groups/intellectual_property_law/publications/landslide/2018-19/january-february/artificial-intelligence-trade-secrets-webinar/.

[137] Casey Chan, *This is the Vault where KFC Guards the Colonel's Secret Original Recipe*, GIZMODO (Oct. 29, 2014), https://gizmodo.com/this-is-the-vault-where-kfc-guards-the-colonels-secret-1650566046.

[138] IT Chronicles, *What is Big Data*, IT CHRONICLES (2022), https://itchronicles.com/what-is-big-data/.

[139] *See generally* Ramaswamy Chandramouli & Doron Pinhas, *Security Guidelines for Storage Infrastructure*, NIST SPECIAL PUBL'N 800-209: NAT'L INST. OF STANDARDS AND TECH. (Oct. 2020), https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-209.pdf.

[140] Gianluca Mauro, *I Reverse-Engineered a $500M Artificial Intelligence Company in One Week. Here's the Full Story*, STARTUP GRIND (Mar. 16, 2017), https://medium.com/startup-grind/i-reverse-engineered-a-500m-artificial-intelligence-company-in-one-week-heres-the-full-story-d067cef99e1c.

[141] WIPO, *The Story of AI in Patents*, WIPO www.wipo.int/tech_trends/en/artificial_intelligence/story.html (last visited Oct. 8, 2021).

produce a particular" desirable perfume odor.[142] The combination of the two (i.e., advanced ML algorithms, an olfactory actuator and other hardware) creates a patentable system.[143] Surely, the company that created such a system would be wary of trying to keep the system a trade secret. Relying solely on trade secret laws is too dangerous a gamble for any patent-worthy AI system. Global annual perfume sales alone exceed $30 billion.[144] Would the Philyra AI product composition system survive for very long as a trade secret? Probably not. However, as a patent, a twenty-year monopoly on a piece of the extensive perfume industry would be quite valuable.

It is recommended that patent-worthy AI systems warrant seeking patent protection. In such a situation, the Class 706 patent should be sought. In the unlikely case that the AI system is found unpatentable, the utmost care should be used to retain the algorithms as trade secrets only.[145] The zero-trust approach seems the best option for keeping AI-related trade secrets secret.[146] As the Supreme Court held, "[w]here patent law acts as a barrier, trade secret law functions relatively as a sieve."[147] The same seems to remain true today, notwithstanding the passage of the DTSA.[148] Keeping a secret is difficult, particularly when large sums of money are at stake.

This article began with a definition of AI and trade secrets. It then synthesized the relationship between the two. Initially, it was assumed that there was a concept of AI and trade secret law, just as there is a well-established relationship between AI and intellectual property in general and AI and patent law specifically. It was discovered that there is no thought-out concept of AI and trade secret law because algorithms, which are essential for AI, are not viable for patent protection standing alone. Trade secret law is the only true IP protection for algorithms.[149] However, notwithstanding the current situation of patent ineligibility for algorithms, perhaps in years to come, algorithms will be patentable.[150]

However, in the future, data protection will likely become so powerful that algorithms will be safely protected as trade secrets, eliminating the need to pursue any patents.[151] While this is yet to occur, it can be predicted that this will likely come to fruition in years to come. It is the opinion of the author of this essay that trade secret tools will likely become so powerful that trade secret law will transcend patent law, and, in effect, there will be a no-fear-of-loss scenario where an electronic secret is truly

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[142] WIPO IP Portal, *1. US20140324222—Determining Combinations of Odors to Produce a Target Olfactory Pleasantness*, PATENTSCOPE
https://patentscope.wipo.int/search/en/detail.jsf?docId=US123649969 (last visited Oct. 8, 2021).

[143] *Id.*

[144] Grand View Research, *Perfume Market Size, Share & Trends Analysis Report by Product (Mass, Premium), by End User (Men, Women), by Distribution Channel (Offline, Online), by Region, and Segment Forecasts, 2019 – 2025*, Report Summary, GRAND VIEW RESEARCH (June 2019), www.grandviewresearch.com/industry-analysis/perfume-market.

[145] USPTO, *supra* note 59.

[146] Collett, *supra* note 95.

[147] *Kewanee Oil Company*, 416 U.S. at 489-90.

[148] Defend Trade Secrets Act of 2016, Pub. L. No. 114–153, 130 Stat 376 (2016).

[149] Viola C Didier, *Why it is so Important for Companies to Protect Their Algorithms*, DELOITTE (2022), https://www2.deloitte.com/dl/en/pages/legal/articles/schutz-algorithmen.html.

[150] Foss-Solbrekk, *supra* note 79.

[151] Dave Vellante & David Floyer, *A New Era of Innovation: Moore's Law is Not Dead and AI is Ready to Explode*, SILICONANGLE (Apr. 10, 2021), https://siliconangle.com/2021/04/10/new-era-innovation-moores-law-not-dead-ai-ready-explode/.

secret. For example, there will be many near-omniscient bells and whistles inherent in electronic trade secret repositories protecting secrets within and without the repository as we understand "repository" today. Because of this, owners will only use their secrets in the manner and method they desire, so the "secret" really will remain secret. This would prevent unauthorized use, acquisition, and misappropriation. Is this arguably the next step after the internet or the cloud, the sky?[152] Perhaps at that time, both trade secret law and patent law will be redundant concepts. Presently, a level of super protection does not exist, meaning both trade secret and patent laws are tools necessary for intellectual property protection. Surely, something along the lines of super protection will exist by the end of the twenty-first century.

In 1964, Arthur C Clarke, author of *2001: A Space Odyssey*, predicted our current internet way of life. Clarke's prediction was spot on—50 years in advance, it served as the precursor to one of the best works of science fiction.[153] However, I predict that in 50 years or sooner, there will be a legitimate concept of AI and trade secret law where they are the same. All AI will be implicitly secret.[154] Reverse-engineering of AI will be impossible, and there will be no need for trade secret law as it is understood in its current variety of intellectual property meanings and accompaniment.[155] A trade secret will truly be a secret.[156] Lastly, it is predicted that whatever entity or nation dominates AI will dominate the world.[157]

Interestingly, in September 2021, following a decision by the Fourth Circuit, a UK Court of Appeals denied patentability for AI-generated patents.[158] However, in July 2021, South Africa granted patents to the AI per se that created inventions.[159] Perhaps South Africa and Australia have different views on the patentability of algorithms, and the concept of AI and trade secret law may not be a misnomer in those locales.[160]

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[152] Richard MacManus, *Sky Computing, the Next Era After Cloud Computing*, THE NEWSTACK (Aug. 9, 2021), https://thenewstack.io/sky-computing-the-next-era-after-cloud-computing/.

[153] ARTHUR C. CLARKE, 2001: A SPACE ODYSSEY (New Am. Library 1968). *See also* Kieron Middleton, *Arthur C Clarke Predicts the Internet in 1964*, YOUTUBE (Dec. 23, 2013), www.youtube.com/watch?v=wC3E2qTCIY8.

[154] *Id.*

[155] *Id.*

[156] *Id.*

[157] *Id.*

[158] Thaler v. Hirshfeld, 558 F. Supp. 3d 238, 249 (E.D. Va. 2021); *Thaler v Comptroller General of Patents Trademarks And Designs* [2021] EWCA Civ 1374.

[159] Seiko Hidaka, *Updated: Court of Appeal—AI Generated Inventions Denied UK Patent in DABUS Case*, GOWLING WLG (Sept. 23, 2021), https://gowlingwlg.com/en/insights-resources/articles/2021/ai-invention-denied-patent-in-dabus-case/.

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