

EDUCATING ROBOT-PROOF ATTORNEYS

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I. INTRODUCTION

Technology, particularly that powered by Artificial Intelligence (AI), is disrupting the legal profession. In the coming years, lawyers who do not understand technology will face both ethical and professional risks. This year, the duty of technological competence marks its tenth anniversary. While lawyers are still learning what the duty means and what it will mean in the future, one thing is certain: those who ignore it could find themselves at risk of being on the wrong side of an ethics violation.

However, even without that regulatory obligation, lawyers who continue to ignore the current technological revolution put themselves at risk of being replaced – if not by robots, then certainly by those lawyers who are using technology to drastically increase their efficiency, provide better service to clients, and cut costs. As Suffolk University Law Dean Andrew Perlman has written, “Technology is playing an ever more important role, and lawyers who fail to keep abreast of new developments face a heightened risk of discipline or malpractice as well as formidable new challenges in an increasingly crowded and competitive legal marketplace.”¹

As those charged with educating tomorrow’s lawyers, law schools must provide their students with all of the tools they will need to succeed in their practice. In today’s world, this means educating law students to understand and use technology, particularly AI-powered technology. But since technology is constantly changing, it can be challenging to know precisely what that means, and given the rapid advancements and explosion in products on the market, it would likely be impossible for a law school to teach a given student all they might come across. Moreover, even if they could, those skills could be outdated within just a few short years.

Instead, law schools must teach students about both the current technologies and those in the pipeline – those we may not even have imagined yet. Students must be prepared to use current technologies and anticipate and learn about new ones as they arise. This requires a new kind of pedagogy that is complementary to traditional legal pedagogy and builds upon it, preparing students for the skill of continuing their technical education long after they leave law school.

In his book, *Robot-Proof: Higher Education in the Age of Artificial Intelligence* (hereinafter *Robot-Proof*), Northeastern University President

1. Andrew Perlman, *The Twenty-First Century Lawyer’s Evolving Ethical Duty of Competence*, THE PROFESSIONAL LAWYER, Vol. 22, No. 4 (2014).

Joseph E. Aoun describes such a new pedagogy.² Though not specific to legal education, the lessons derived from the book have much to offer those who are re-thinking what law schools should be in the 21st century. Aoun theorizes a pedagogical model that recognizes the importance of concepts that have long been dear to legal pedagogy, such as critical thinking, experiential education, and the ethical and human dimensions of the professions. Added to this is a recognition of the importance of technological and data literacy as well as the infusion of an entrepreneurial mindset. The insights from his book provide an excellent starting point for legal educators who are looking for ways to ensure that their students are not left behind in the ongoing digital revolution.

This article describes the ethical and professional issues that will increasingly face lawyers as the AI revolution rolls on. Law schools must face these issues both because their students will be required to have this knowledge to practice ethically and because their students may eventually find themselves unemployable without it. In Part II of this article, I argue that the duty of technological competence, when read with other technology-related precedent and rules, implies not only the duty to understand the technology that one might use in practice but, under certain circumstances, an affirmative duty to explore and use new legal technology. In Part III of this article, I describe how technology is disrupting the legal profession and the existential risks that lawyers face if they refuse to adapt. I also provide specific examples of AI-powered technology that already exists, including some that, just a few years ago – let alone a generation ago – would have seemed unimaginable to most lawyers. In Part IV, I shift gears to describe the pedagogical model outlined in *Robot-Proof* and provide a real-world example of how I applied it to a new course in legal technology at the University of North Dakota School of Law. Finally, I conclude with a call to action for legal educators to move more quickly into the future, before it leaves both them and their students behind.

II. AN AFFIRMATIVE DUTY TO USE TECHNOLOGY

The year 2012, when the American Bar Association (ABA) first adopted the duty of technological competence, marked a “sea change” in the legal profession.³ The duty may have appeared unimposing at first, just a short

2. JOSEPH E. AOUN, *ROBOT-PROOF: HIGHER EDUCATION IN THE AGE OF ARTIFICIAL INTELLIGENCE* XV-XXI (2018).

3. Jamie J. Baker, *Beyond the Information Age: The Duty of Technology Competence in the Algorithmic Society*, 69 S.C. L. REV. 557, 558-59 (2018) (citing Robert Ambrogi, *New ABA Ethics Rule Underscores What EDD Lawyers Should Already Know: There’s No Hiding from Technology*, CATALYST REPOSITORY SYS. (Aug. 16, 2012), <https://catalystsecure.com/blog/2012/08/new-aba-ethics-rule-underscores-what-edd-lawyers-should-already-know-theres-no-hiding-from-technology/>).

clause added to a comment to the traditional duty of competence. The text of Rule 1.1, Comment 8 reads as follows: “To maintain the requisite knowledge and skill, a lawyer should keep abreast of changes in the law and its practice, *including the benefits and risks associated with relevant technology*, engage in continuing study and education and comply with all continuing legal education requirements to which the lawyer is subject.”⁴

Yet, the duty is arguably one of the most significant changes to the Model Rules since their creation. As with all aspects of competence, the word “maintain” and the phrase “keep abreast of changes” indicate not a static obligation but a continuing one. Indeed, the term “continuing” itself also appears here, delineating attorneys’ responsibility to engage in continuing legal education. Thus, an attorney who understands, for example, how Westlaw works today is not off-the-hook in terms of understanding how Westlaw works in 2030. Instead, in 2030, that attorney will have a similar obligation to understand whatever technology exists at that time, whether it be new iterations of currently standard technology or something else entirely.

As of this writing, “40 states have adopted the duty of technology competence[.]”⁵ Nonetheless, significant discussion continues as to what it means.⁶ At a minimum, attorneys have a duty to understand the technology that they are using in their practice and stay current on new and emerging legal technology.⁷ However, it also appears that the duty envisions something more. In this section, I argue that attorneys have a duty not only to understand the technology that they currently use but also, an affirmative duty to adopt new technology under certain circumstances.

First, it is worth noting that memorializing the duty assures that attorneys are not disincentivized from trying or learning new technologies as they emerge. If the duty of technological competence only required attorneys to understand technologies that they were currently using, technophobic attorneys would be incentivized not to try new things, which could ultimately result in detriment to their clients. Incentivizing attorneys to use technologies that could improve client representation was arguably one of the core

4. MODEL RULES OF PRO. CONDUCT r. 1.1 cmt. 8 (AM. BAR ASS’N 2021) (emphasis added).

5. Robert Ambrogi, *Tech Competence*, LAWSITES, <https://www.lawnext.com/tech-competence> (last visited Apr. 25, 2022) (Mr. Ambrogi keeps an up-to-date listing of the states that have adopted the duty on his LawSites blogging website).

6. See, e.g., Baker, *supra* note 3; see also Katy (Yin Yee) Ho, *Defining the Contours of an Ethical Duty of Technological Competence*, 30 GEO. J. LEGAL ETHICS 853 (2017); Lori D. Johnson, *Navigating Technology Competence in Transactional Practice*, 69 VILL. L. REV. 159 (2020).

7. See Don Macaulay, *What is a Lawyer’s Duty of Technology Competence*, SMARTLAWYER, (Feb. 2, 2018), <https://nationaljurist.com/smartlawyer/what-lawyers-duty-technology-competence>.

motivations behind implementing the new duty.⁸ Indeed, when the ABA adopted the new duty, it was arguably clear that such a duty already existed.

The duty of technological competence and the small number of legal interpretations of it to date, have been explored in depth elsewhere.⁹ Here, instead of rehashing that work, I look instead at what courts and the ABA have said about technology use outside of the duty. In particular, I look at what courts have said about obligations to use technology in legal research, an area that underwent its own technological revolution in the late 20th and early 21st centuries and continues to evolve.¹⁰ I also look at what the ABA has said about the obligation to keep client information secure in an age where much of what attorneys do happens over the Internet.

A. TECHNOLOGY OBLIGATIONS IN LEGAL RESEARCH

To show competence, attorneys must conduct adequate legal research.¹¹ Whether legal research is “adequate” adequate involves two intertwined issues: (1) whether the attorney is citing “good” sources; and (2) whether the attorney is using standard methods of legal research commonly accepted in the profession.¹² Implicit in this inquiry is whether the attorney’s legal research methods were efficient. Under Model Rule 1.5, attorneys must avoid charging their clients unreasonable fees.¹³ Although this rule applies in several areas, in the legal research context, it means attorneys must research the law without imposing unreasonable costs on the client. And whether or not legal research costs are reasonable is inherently tied to whether the attorney applied standard methods to obtain the results.

Today, using “standard methods” almost certainly includes using online sources, whether free or fee-based.¹⁴ While, in the past, courts occasionally

8. See ABA Commission on Ethics 20/20 Introduction and Overview 1, 4-5 (2012) (describing technological changes in the practice of law and the need for attorneys to understand such changes to adequately represent clients).

9. See, e.g., Baker, *supra* note 3; see also Tracy Vigness Kolb, *Technology Competence: The New Ethical Mandate for North Dakota Lawyers and the Practice of Law*, 92 N.D. L. REV. 91 (2016); John G. Browning, *The New Duty of Digital Competence: Being Ethical and Competent in the Age of Facebook and Twitter*, 44 U. DAYTON L. REV. 179 (Spring 2019).

10. See Ian Gallacher, *Forty-Two: The Hitchhiker’s Guide to Teaching Legal Research to the Google Generation*, 39 AKRON L. REV. 151, 153, 166 (2006).

11. Ellie Margolis, *Surfin’ Safari—Why Competent Lawyers Should Research on the Web*, 10 YALE J. L. & TECH. 82, 103 (2007).

12. See *id.* at 106 (noting that judges evaluating a lawyer’s research look first at whether relevant sources were provided and, if not, at what the standard process in the field is).

13. MODEL RULES OF PRO. CONDUCT r. 1.5 (AM. BAR ASS’N, 2021).

14. See Margolis, *supra* note 11, at 107. Indeed, multiple scholars have noted the existence in case law of what they colloquially call a “duty to Google,” which is, in essence, a duty to use the internet when conducting research. See, e.g., Betsy Lenhart, *The Seventeenth Century Meets the Internet: Using a Historian’s Approach to Evaluating Documents as a Guide to Twenty-First Century Online Legal Research*, 9 LEGAL COMM. & RHETORIC: JALWD 21, 32-35 (2012); CAROLE A.

questioned the need for what was, at the time, dubbed “Computer-Assisted Legal Research” or CALR,¹⁵ more recent cases are apt to critique attorneys for *not* using such resources rather than for using them.¹⁶

Paradoxically, an example of an early case in which a judge found an attorney should *not* have used CALR is instructive. In *Coleman v. Dydula*,¹⁷ the judge wrote:

Defendants claim that Westlaw research was necessary because Mr. Sliwa does not have a complete set of the Federal Rules Decisions at his firm. However, as plaintiffs note, these volumes are available at the State Supreme Court library where the cases could have been printed from CD-ROM at no charge. This court also notes that the library at the Federal Courthouse and the Law Library at the University of Buffalo shelve these volumes as well. This court will not require plaintiffs to pay for an item of convenience for Mr. Sliwa when alternatives were readily available.¹⁸

Coleman shows that the judge was primarily concerned with what he deemed the excessive costs of Westlaw compared to readily available alternatives. Yet, as more information has gone online, print alternatives may not be so readily available. More and more, law libraries are shifting from print collections to online collections.¹⁹ While this certainly does not eliminate the need for attorneys to be cost-conscious in determining which resources to use, it does change what alternatives are readily available. For example, in current times, Mr. Sliwa might still be obligated to go to his public law library if it could drastically cut costs. But once he arrives there, he would likely use a public Westlaw terminal or other electronic resources rather than print resources.

Indeed, more recently, courts have found that attorneys are actively obligated to use electronic resources when available and when they would likely find better results or substantially reduce client costs. For example, in *Davis v. Dep’t of Just.*,²⁰ the United States Court of Appeals for the District of Columbia held the FBI had failed to comply with a Freedom of Information Act (FOIA) request when the agency claimed it could not comply with turning

LEVITT & MARK E. ROSCH, GOOGLE FOR LAWYERS: ESSENTIAL SEARCH TIPS AND PRODUCTIVITY TOOLS, Ch. 1 (2010).

15. See *Coleman v. Dydula*, 175 F.R.D. 177, 182 (W.D.N.Y. 1997).

16. See *Davis v. Dep’t of Just.*, 460 F.3d 92, 102-03 (D.C. Cir. 2006).

17. 175 F.R.D. 177 (W.D.N.Y. 1997).

18. *Id.* at 182.

19. See Ashley Krenelka Chase, *Neutralizing Access to Justice: Criminal Defendants’ Access to Justice in a Net Neutrality Information World*, 84 MO. L. REV. 323, 351-353 (2019) (describing how law libraries are increasingly shifting to online resources and how print resources are becoming rarer and more expensive).

20. 460 F.3d 92 (D.C. Cir. 2006).

over specific recordings due to privacy reasons because it was unsure whether certain involved individuals were living or dead.²¹ The FBI had searched in print sources but had not used the internet. The court said:

Surely, in the Internet age, a ‘reasonable alternative’ for finding out whether a prominent person is dead is to use Google (or any other search engine) to find a report of that person’s death. Moreover, while finding a death notice for the second speaker—the informant—may be harder (assuming that he was not prominent), Googling also provides ready access to hundreds of websites collecting obituaries from all over the country, any one of which might resolve that speaker’s status as well.²²

As electronic resources change and advance, attorneys must keep up. In a recent Canadian decision, a judge specifically questioned why an attorney had not used AI-powered legal research when it would have been more efficient.²³ Indeed, it is highly likely that in the next few years, attorneys will be obligated to use AI-powered legal research tools because those will be the only ones available.²⁴ Under even the most minimally intrusive reading of the duty of technological competence, this would mean attorneys would need to learn about and understand how AI works.

B. TECHNOLOGY OBLIGATIONS RELATED TO CYBERSECURITY

One of the few areas related to technology in which the ABA Standing Committee has provided significant guidance – cybersecurity – is instructive in showing the committee’s intent in terms of when attorneys must use new technologies and how much they need to know.

In the security arena, the ABA Standing Committee on Ethics and Professional Responsibility (ABA Standing Committee) has made it clear that attorneys must know enough about technology (or hire someone who does) to ensure that client communications are secure.²⁵ In 2012, at the same time that they adopted the Duty of Technological Competence, the Standing Committee added a new part (c) to Model Rule 1.6, which addresses the duty of confidentiality.²⁶ New part (c) reads: “A lawyer shall make reasonable efforts

21. *Id.* at 95.

22. *Id.* at 103.

23. *Cass v. 1410088 Ontario, Inc.*, 2018 CanLII 6959 (Can. Ont. S.C.).

24. *See* John G. Browning and Christine “Chris” Krupa Downs, *The Future is Now*, 82 TEX. B.J. 508, 509 (2019) (“Some legal observers even theorize that the failure to use AI could be considered malpractice one day.”).

25. *See* ABA Comm. on Ethics & Pro. Resp., Formal Op. 477R (revised May 22, 2017).

26. *Id.*

to prevent the inadvertent or unauthorized disclosure of, or unauthorized access to, information relating to the representation of a client.”²⁷

The Standing Committee adopted two comments to go along with the new part (c). Comment 18 governs the safeguarding of information and requires attorneys to make “reasonable efforts to prevent the access or disclosure” of information related to a client’s representation.²⁸ The comment further delineates a set of non-exhaustive factors to determine whether such measures were reasonable. Those factors include:

- the sensitivity of the information,
- the likelihood of disclosure if additional safeguards are not employed,
- the cost of employing additional safeguards,
- the difficulty of implementing the safeguards, and the extent to which the safeguards adversely affect the lawyer’s ability to represent clients (e.g., by making a device or important piece of software excessively difficult to use).²⁹

Comment 19 governs security in transmitting information and states, “When transmitting a communication that includes information relating to the representation of a client, the lawyer must take reasonable precautions to prevent the information from coming into the hands of unintended recipients.”³⁰ Comment 19 makes explicit that special security measures are not

27. MODEL RULES OF PRO. CONDUCT r. 1.6(c) (AM. BAR ASS’N 2021).

28. *Id.* at r. 1.6 cmt. 18. Comment 18 reads:

“Paragraph (c) requires a lawyer to act competently to safeguard information relating to the representation of a client against unauthorized access by third parties and against inadvertent or unauthorized disclosure by the lawyer or other persons who are participating in the representation of the client or who are subject to the lawyer’s supervision. *See* Rules 1.1, 5.1, and 5.3. The unauthorized access to, or the inadvertent or unauthorized disclosure of, information relating to the representation of a client does not constitute a violation of paragraph (c) if the lawyer has made reasonable efforts to prevent the access or disclosure. . . .

A client may require the lawyer to implement special security measures not required by this Rule or may give informed consent to forgo security measures that would otherwise be required by this Rule. Whether a lawyer may be required to take additional steps to safeguard a client’s information in order to comply with other law, such as state and federal laws that govern data privacy or that impose notification requirements upon the loss of, or unauthorized access to, electronic information, is beyond the scope of these Rules. For a lawyer’s duties when sharing information with nonlawyers outside the lawyer’s own firm, *see* Rule 5.3, Comments [3]-[4].” *Id.*

29. *Id.*

30. *Id.* at r. 1.6 cmt. 19 (AM. BAR ASS’N 2021). The full text of Comment 19 reads:

“When transmitting a communication that includes information relating to the representation of a client, the lawyer must take reasonable precautions to prevent the information from coming into the hands of unintended recipients. This duty, however, does not require that the lawyer use special security measures if the method of communication affords a reasonable expectation of privacy. Special circumstances, however, may warrant special precautions. Factors to be considered in determining the reasonableness of the lawyer’s expectation of confidentiality:

include the sensitivity of the information and

required “if the method of communication affords a reasonable expectation of privacy.”³¹ However, certain circumstances may warrant special precautions, again determined by a factors test. In this case, the factors include:

- the sensitivity of the information and
- the extent to which the privacy of the communication is protected by law or by a confidentiality agreement.³²

Both comments 18 and 19 also clarify that attorneys must be prepared to provide special security measures if requested by a client. Together, comments 18 and 19 affirm the obligation to keep client information confidential in the digital age and to know something about how that is done.³³ The Standing Committee took this affirmative obligation a step further in 2017, when they issued Formal Opinion 17-477R, an update to an earlier opinion addressing unencrypted email communications.³⁴

Formal Opinion 17-477R stated that attorneys must make reasonable efforts to ensure that communications with their clients are secure and not subject to inadvertent or unauthorized cybersecurity breaches.³⁵ The opinion lists seven affirmative obligations that an attorney must undertake to show they have made reasonable efforts. Those seven obligations include:

- Understand the nature of the threat
- Understand how client confidential information is transmitted and where it is stored
- Understand and use reasonable electronic security measures
- Determine how electronic communications about clients’ matters should be protected
- Label client confidential information

the extent to which the privacy of the communication is protected by law or by a confidentiality agreement.

A client may require the lawyer to implement special security measures not required by this Rule or may give informed consent to the use of a means of communication that would otherwise be prohibited by this Rule. Whether a lawyer may be required to take additional steps in order to comply with other law, such as state and federal laws that govern data privacy, is beyond the scope of these Rules.”

31. *Id.*

32. *Id.*

33. Firms and attorneys who can afford to hire IT staff or consultants likely need to know less than those in charge of their own cybersecurity. Nevertheless, even attorneys who can rely on outside help must know enough to know when to ask for it. For example, for attorneys to ensure that they are using “reasonable security measures,” they must understand the threat to the particular information and what sorts of security measures are available.

34. ABA Comm. on Ethics & Pro. Resp., Formal Op. 477R (revised May 22, 2017). Formal Opinion 99-413 was issued in 1999, as email was becoming more and more common, and affirmed that communicating with clients via unencrypted email “afford[ed] a reasonable expectation of privacy from a technological and legal standpoint.” ABA Comm. on Ethics & Pro. Resp., Formal Op. 413 (1999).

35. ABA Comm. on Ethics & Pro. Resp., Formal Op. 477R (revised May 22, 2017).

- Train lawyers & nonlawyer assistants in technology and information security
- Conduct due diligence on vendors providing communications technology.³⁶

The opinion also notes that, under certain circumstances, such as in the case of particularly sensitive information, attorneys may be obligated to discuss security measures with their clients.³⁷

III. THE TRANSFORMATION OF THE LEGAL PROFESSION

In the previous section, I argued that the Duty of Technological Competence imposes on attorneys not only a duty to understand the technology they are using but also, under some circumstances, to adopt new technology. Indeed, this has arguably always been the case. What makes things different now is that, due to advances in AI, there has been an enormous explosion in the amount and type of technology available as well as the vast array of lawyerly tasks in which it is used. Instead of asking attorneys to adjust to one or two new technologies at a time – electronic legal research or email or Google, etc. – attorneys are now faced with new technologies in a multitude of areas, as well as technologies that could, conceivably, change the very nature of what they do.

Throughout history, there have been times when new explosions in technology have been so great as to transform working life completely, both how we work and what work we do.³⁸ During each of these times, entire industries were created or collapsed.³⁹ Yet some professions have been remarkably resilient, updating and adjusting with the times without drastically transforming their core functions. The legal profession has traditionally been counted in this latter category.⁴⁰ But the latest technological revolution, fueled by the rise in artificial intelligence, portends something different.⁴¹

36. *Id.* at 6-9.

37. *Id.* at 5.

38. *See generally* Aoun, *supra* note 2, at 12 (describing the progression of work from primarily agrarian to industrial to digital).

39. *Id.* at 2 (“Machines have been replacing human labor ever since a piece of flint proved to be sharper than a fingernail.”).

40. *See* RICHARD SUSSKIND & DANIEL SUSSKIND, *THE FUTURE OF THE PROFESSIONS* 67 (Oxford Univ. Press 2015) (“[T]he working practices of lawyers and judges have not changed much since the time of Charles Dickens. The set-up that has endured is fairly similar around the world, whether in support of resolving disputes, advising on transactions, or in counselling clients on their rights and duties. Legal advice is handcrafted by lawyers in partnership, delivered on a one-to-one basis, the output is documentation (often voluminous), and since the mid-1970s charging has generally been on an hourly-billing basis.”).

41. *See* Aoun, *supra* note 2, at 15 (“[I]t is clear that the current digital revolution is different from previous technological leaps because machines now seem to have no limit to their potential processing power – no limit to their intelligence.”).

In 2013, legal futurist Richard Susskind wrote, “Legal institutions and lawyers are at a crossroads . . . and are poised to change more radically over the next two decades than they have over the last two centuries.”⁴² Nearly halfway through those two decades, the average attorney could be forgiven for thinking that Susskind overstated the case. Indeed, over the past decade, some legal commentators have dismissed the notion of a massive impending change in the legal profession, at least of the kind that might displace a large number of attorneys from the profession.⁴³ These commentators have argued that, for the most part, lawyers are safe because much of what they do has traditionally been difficult for machines to replicate: complex legal analysis, legal writing, client advising, etc.⁴⁴ They noted that while AI might upend how attorneys perform routine legal tasks, there were multiple kinds of tasks attorneys perform that computers cannot replicate.⁴⁵

More and more, though, commentators are beginning to sound the alarm that lawyers may be at risk after all, and sooner rather than later.⁴⁶ It turns out, some of these higher-level tasks, which not long ago seemed firmly within the purview of humans, are nearly as susceptible to automation as more routine tasks.⁴⁷

This section will first provide a brief overview of Artificial Intelligence and related technologies that drive innovation in the legal technology arena. It will then provide specific examples of existing and emerging AI-powered products poised to revolutionize the legal profession.

42. RICHARD SUSSKIND, *TOMORROW’S LAWYERS: AN INTRODUCTION TO YOUR FUTURE*, xiii (2013).

43. Steve Lohr, *AI is Doing Legal Work. But it Won’t Replace Lawyers, Yet*, N.Y. TIMES, Mar. 19, 2017.

44. See, e.g., Elizabeth C. Tippet & Charlotte Alexander, *Robots are Coming for the Attorneys – Which may be Bad for Tomorrow’s Attorneys but Good for Anyone in Need of Cheap Legal Assistance*, THE CONVERSATION (Aug. 9, 2021 3:17 PM), <https://theconversation.com/robots-are-coming-for-the-lawyers-which-may-be-bad-for-tomorrows-attorneys-but-great-for-anyone-in-need-of-cheap-legal-assistance-157574> (noting that the “complicated, personalized” tasks that lawyers engage in, such as drafting briefs and advising clients, have led some technologists to consider their jobs “safe.”).

45. See, e.g., Frank Pasquale & Glyn Cashwell, *Four Futures of Legal Automation*, 63 UCLA L. REV. DISCOURSE 26, 47 (2015) (arguing that whether or not a given legal task is automatable depends on its simplicity or complexity); see also Dana Remus & Frank Levy, *Can Robots Be Lawyers?*, 30 GEORGETOWN J. OF L. & ETHICS 501, 508 (2017) (arguing that tasks that can be automated are those that are “structured” or “routine.”).

46. One estimate indicates that up to 23% of a lawyer’s current tasks can be automated by existing technology. See Abigail Johnson Hess, *Experts Say 23% of Lawyer’s Work Can be Automated – Law Schools are Trying to Stay Ahead of the Curve*, CNBC (Feb. 18, 2020 5:13 AM), <https://www.cnbc.com/2020/02/06/technology-is-changing-the-legal-profession-and-law-schools.html>.

47. See Tippet & Alexander, *supra* note 44 (describing a project in which they used machine learning to analyze legal briefs and concluding, “lawyers’ jobs are a lot less safe than we thought. It turns out that you don’t need to completely automate a job to fundamentally change it. All you need to do is automate part of it.”).

A. THE DIFFICULTY OF DEFINING AI

Articles abound, both in law reviews and elsewhere, describing Artificial Intelligence (AI) and its capabilities in depth.⁴⁸ Thus, it should be easy to define. Instead, there are nearly as many definitions of AI as there are applications for it. For example:

“AI is the use of automated, computer-based means by which large amounts of data are processed and analyzed to reach reasoned conclusions.”⁴⁹

“Artificial intelligence is the process of simulating human intelligence through machine processes.”⁵⁰

“[AI is] ‘the art of creating machines that perform functions that require intelligence when performed by people,’ centering on the ability to make independent choices.”⁵¹

While most definitions of AI capture the basic idea that AI, in some fashion, replicates human intelligence, the vast array of definitional formulations likely reflects that human intelligence itself is ill-defined in this context. What does it mean to say that AI can do something that usually requires human intelligence? After all, even the simplest problems that computers perform, like addition and subtraction, require human intelligence.

Because of this fluidity in the definition, it can be hard to determine which systems use AI and which do not. Indeed, if a company was inclined to exaggerate how much AI its systems used, one would be hard-pressed to prove them wrong based on any of the layman’s definitions available to us.⁵² Nonetheless, to help frame this article and focus on newer technologies, it is helpful to distinguish between what is meant by AI-based legal technology

48. See, e.g., Nancy B. Talley, *Imagining the Use of Intelligent Agents and Artificial Intelligence in Academic Law Libraries*, 108 LAW LIBR. J. 383 (2016); Emily Janoski-Haehlen & Sarah Starnes, *The Ghost in the Machine: Artificial Intelligence in Law Schools*, 58 DUQ. L. REV. 3 (2020); David C. Vladeck, *Machines Without Principles: Liability Rules and Artificial Intelligence*, 89 WASH. L. REV. 117 (2014); Mark Piesing, *Predicting the Future of Artificial Intelligence Has Always Been a Fool’s Game*, WIRED (Mar. 30, 2013), <https://perma.cc/2JCT-YTMF>; Stephen Hawking, et al., *Stephen Hawking: “Transcendence Looks at the Implications of Artificial Intelligence—But Are We Taking AI Seriously Enough?”*, INDEPENDENT (May 1, 2014), <http://www.independent.co.uk/news/science/stephen-hawking-transcendence-looks-at-the-implications-of-artificial-intelligence—but-are-we-taking-ai-seriously-enough-9313474.html>.

49. Wendy Wen Yun Chang, *Time to Regulate AI in the Legal Profession? (Perspective)*, BIG LAW BUS. (Jul. 12, 2016), <https://biglawbusiness.com/time-to-regulate-ai-in-the-legal-profession-perspective/>.

50. Sean Semmler & Zeeve Rose, *Artificial Intelligence: Application Today and Implications Tomorrow*, 16 DUKE L. & TECH. REV. 85, 86 (2017).

51. James M. Donovan, *Benefits, Drawbacks, and Risks of AI*, in LAW LIBRARIANSHIP IN THE AGE OF AI 131, 131 (Ellyssa Kroski ed., 2020).

52. See, e.g., Christian Nolan, *Is Your Law Firm Ready for Artificial Intelligence?*, 90 N.Y. STATE BAR ASS’N J. 12, 12 (2018) (quoting attorney Maura R. Grossman, former Chair of the Artificial Intelligence Subcommittee of the New York State Bar Association’s Committee on Technology) (“Artificial intelligence is sort of the shiny new label reapplied to many technologies that have been around for some time.”).

and traditional legal technology. This article will focus on three specific components of AI: predictive analytics, machine learning, and natural language processing.⁵³ This section will briefly define these components before turning to how they are being used in the legal profession.

1. *Predictive Analytics*

Predictive analytics involves the use of data science techniques⁵⁴ to predict outcomes.⁵⁵ As one expert put it, “It’s about taking the data that you know exists and building a mathematical model from that data to help you make predictions about somebody [or something] not yet in that data set.”⁵⁶ Predictive analytics have been used in multiple disciplines, from medicine to meteorology.⁵⁷ Uses in law include:

(1) e-discovery (including document culling, early case assessment, and fact-finding), followed by (2) case management (including management of outside counsel, comparing projected spending to actual spending, resource allocation, and budgeting), (3) review and analysis of contracts, and (4) information governance (including facilitating defensible disposition, facilitating compliance with records policies and other requirements, and facilitating data migration).⁵⁸

53. See Donovan, *supra* note 51, at 131 (“Four components differentiate AI from even high-end automation: big-data and predictive analytics, deep-learning software, cloud computing, and natural language processing (NLP).”).

54. See Mark K. Osbeck, *Lawyer as Soothsayer*, 123 PENN ST. LAW REV. 41, 82 (2018) (“Data science includes traditional analytics techniques such as optimization, forecasting, and simulation, along with more recent innovations such as data mining, artificial intelligence clustering, machine-learning, and detection of outliers.”).

55. *Id.*

56. Ashley DiFranza, *Predictive Analytics: What It Is & Why It’s Important*, NE. U. GRADUATE PROGRAMS BLOG (Feb. 17, 2021), <https://www.northeastern.edu/graduate/blog/predictive-analytics/> (quoting Thomas Goulding).

57. See Osbeck, *supra* note 54, at 82-83 (“In the realm of politics, for example, analysts such as Nate Silver have used predictive analytics with some degree of success to anticipate election results. In the area of medicine, predictive analytics has shown promise in predicting disease outbreaks, helping physicians diagnose diseases, and in advancing genomics research. In the area of sports, predictive analytics has been used for gambling purposes to predict the outcome of games and tournaments, as well as by teams to predict (e.g., for purposes of determining how much to spend on a free-agent, or which rookie to draft) the likelihood that a player’s career will continue its current trajectory or improve. In the field of meteorology, predictive analytics has been used to improve weather forecasts. And in the business world, predictive analytics has been successfully used for a variety of purposes. Most notably, it is used for marketing and advertising purposes to identify consumers in a targeted manner who might be most likely to purchase particular products. However, there are a host of other business uses for predictive analytics, ranging from consumer fraud detection, to evaluating consumer debt risks, to helping dating services find promising matches, to enabling autonomous cars to operate, to automatically customizing music “stations” for individual listeners, and so on.”).

58. *Id.* at 86-87.

2. *Machine Learning*

In the past, computers functioned primarily by acting out specific directions as input by the user. Machine learning, in contrast, is the ability of a computer to learn from that input and take new or different actions based on what was learned.⁵⁹ In this way, it bears some resemblance to the law itself. As one commentator noted, “Machine learning and law operate according to strikingly similar principles: they both look to historical examples to infer rules to apply to new situations.”⁶⁰ Machine learning works hand-in-hand with predictive analytics and has been used in contract review, contract analysis, and litigation prediction, among other areas.⁶¹

3. *Natural Language Processing*

Natural language processing (NLP) is a type of AI that allows computers to understand human language, both text and voice, rather than relying on programming languages.⁶² NLP has been used in legal research for over a decade, but it is advancing all the time. For example, “advanced NLP programs can search for concepts, not just specific keywords,” and “NLP programs can analyze a case study or document and suggest other similar cases for lawyers to review.”⁶³ More recently, NLP has been used in the legal field to automate tasks and to draft and analyze legal documents.⁶⁴

B. SPECIFIC EXAMPLES OF AI-DRIVEN LEGAL TECHNOLOGY

To fully understand the nature of the changes on the horizon, it is helpful to understand what changes are already here. Large firms and corporate legal departments are already using sophisticated AI-driven legal technology. While some legal technology has trickled into smaller firms, most of the more advanced technology tends to start in the largest, wealthiest firms and departments. Thus, many attorneys and law professors outside of those settings may have little idea of just how far this technology has come. This misapprehension can lead to a false sense of security – a sense that whatever threats to the profession technological advance might pose lie in a distant, far-off, sci-fi

59. Expert.ai Team, *What is Machine Learning? A Definition.*, EXPERT.AI (May 6, 2020) <https://www.expert.ai/blog/machine-learning-definition/>.

60. Rob Toews, *AI Will Transform the Field of Law*, FORBES (Dec. 19, 2019), <https://www.forbes.com/sites/robtoews/2019/12/19/ai-will-transform-the-field-of-law/?sh=6c8b17c17f01>.

61. *Id.*

62. Shannon Flynn, *How Natural Language Processing (NLP) AI is Used in Law*, LAW TECH. TODAY (June 9, 2021), <https://www.lawtechnologytoday.org/2021/06/how-natural-language-processing-nlp-ai-is-used-in-law/>.

63. *Id.*

64. *Id.*

future. The revolution is already here, and the widespread use of these technologies is only as far off as attorneys' willingness to innovate.

This section will provide a brief overview of five types of legal technology that already exist and look to drastically change law practice in the next five to ten years as they become less expensive and more widely available.⁶⁵

1. eDiscovery Software

Discovery has always been onerous, and this only got worse with the advent of electronic documents.⁶⁶ Attorneys were required to go through massive amounts of documents one at a time, sometimes so many that smaller firms simply could not handle the cases.⁶⁷ Even the larger firms often had to outsource the discovery process, hiring teams of contract attorneys to perform the repetitive task of culling through the documents for relevant terms.⁶⁸

While discovery can still be time- and labor-intensive, the advent of AI-powered eDiscovery software has made it much less so and has significantly reduced costs.⁶⁹ eDiscovery software makes the process more efficient in several ways, from processing⁷⁰ to classification.⁷¹

65. This is a representative list rather than an exhaustive one. While I have used a few company names as illustrative examples, I make no representation about these brands in comparison to others that may exist.

66. See John T. Yip, *Addressing the Costs and Comity Concerns of International E-Discovery*, 87 WASH. L. REV. 595, 595 (2012) (noting the rapid rise in electronically stored information from and commensurately rising costs); see also Rachel K. Alexander, *E-Discovery Practice, Theory, and Precedent: Finding the Right Pond, Lure, and Lines Without Going on a Fishing Expedition*, 56 S.D. L. REV. 25, 26-38 (2011) (noting rise in amount of electronically stored information and discovery costs, the need for attorneys to confer about discovery earlier in the process than previously required, and describing several difficulties with eDiscovery versus traditional paper discovery).

67. Lindsey D. Blanchard, *Rule 37(A)'s Loser-Pays "Mandate": More Bark Than Bite*, 42 U. MEM. L. REV. 109, 134 (2011) (quoting former Supreme Court Justice Louis F. Powell, Jr. arguing in 1978, "Discovery as it now operates may enable the party with the greater financial resources to prevail simply by the threat or reality of exhausting the available resources of the weaker opponent. Settlements are coerced, and persons or businesses of comparatively limited means pay unjust claims, or refrain from pursuing just claims, simply because they cannot afford the cost of litigation. The mere threat of delay and unbearable expense thus denies justice to many actual or prospective litigants.").

68. See Jason Krause, *Discovery Downsized*, 92 ABA JOURNAL 64 (July 2006) (mentioning that in "the paper world . . . large law firms often had to throw teams of attorneys at a document-review project[.]").

69. George R. Bravo, *Artificial Intelligence and Automation in the Modern Law Office*, 38 No. 3 GP SOLO 24 (May/June 2021), noting "OpenText claims that its end-to-end eDiscovery software (<https://www.opentext.com>) reduces review costs up to 80 percent compared to manually reviewing discovery documents.").

70. *Id.* ("Everlaw e-discovery software . . . processes and transcribes more than 400,000 documents an hour while informing you of any duplicates or errors.").

71. *Id.* ("The more you use AI software, the more it learns and fine-tunes its classification of relevant documents. Furthermore, while looking over the documents, the AI can automatically translate the documents, redact any confidential or privileged information, and even predict which uploaded documents are relevant to your case.").

Typical AI-powered eDiscovery software uses attorney-reviewed “seed sets” to get the software started.⁷² Then machine learning takes over as the software learns what to look for from the attorneys using the software.⁷³ Recently though, some companies are attempting to take the software even further. Elevate eDiscovery, for example, is working on software in which the AI is pre-trained, thus eliminating the need for attorneys to spend time teaching the software how to teach itself.

2. *Automated Contract Review*

One of the areas in which AI has been employed most successfully is automated contract review. With automated contract review software, an attorney inputs a contract, and the software then analyzes it and flags anything potentially problematic for further review.

The process generally works by first setting up your own review guidelines for the software to adhere to when reviewing the contract. Afterward, you upload the contract into the software. After a few minutes, the software will provide you with a redlined version, identifying any problematic or missing clauses, any issues that need your attention to review, and any ‘gotcha’ terms. It can even be programmed to automatically correct any clauses. Additionally, the AI will also recommend solutions based on the best practices for your particular issue. Afterward, you can send the “redlined” contract to opposing counsel for their review and response.⁷⁴

One legal technology company, LawGeex, claims that “law firms using [its] software can decrease the amount of time spent reviewing and approving contracts by 80 percent, reduce costs by 90 percent compared to manual contract review, and close deals three times quicker.”⁷⁵ Some companies are even working on software that can automate the contract drafting process. For example, PerfectNDA has released AI-powered software that automatically drafts nondisclosure agreements.⁷⁶

3. *Legal Research*

Over the past several years, legal research has seen an explosion of new AI-based tools. AI-based tools have been incorporated both by the “big

72. See Benjamin L. S. Ritz, *Will This Dog Hunt: An Attorney’s Guide to Predictive Coding*, 57 S. TEX. L. REV. 345, 356 (2016) (“The seed set composes the initial training documents from which the computer learns.”).

73. *Id.*

74. *Id.*

75. *Id.*

76. *Id.*

name” companies, like Westlaw, Lexis, and Bloomberg, and start-ups like Casetext and the now-defunct Ross Intelligence.⁷⁷ These new tools promise to make legal research faster and more efficient, freeing attorneys’ time to focus on more difficult legal tasks such as refining arguments.

One way in which this is happening is through AI-assisted searching. Both Westlaw and Lexis have used natural language processing technology advancements to create AI-assisted searching tools in recent years. Lexis Advance calls their tool “Lexis Answers,”⁷⁸ and Westlaw Edge’s tool is called “WestSearch Plus.”⁷⁹ For the most part, these tools are quite similar to one another:

Both tools provide AI-generated suggested questions while a user is typing search queries, and both display an AI-generated answer on the results page before the actual results of the search are displayed. In both databases, the AI-generated answer appears on the result page if the user either clicks on a suggested question or runs a natural language search.⁸⁰

Westlaw Edge’s other AI-based legal research tools include Folder Analysis, KeyCite Overruling Risk, and a statutes and regulations comparison tool.⁸¹ Folder Analysis uses AI to analyze cases that the user has saved to the Westlaw folder system to suggest additional searches or issues into which the user may want to delve.⁸² KeyCite Overruling Risk is an enhancement to the KeyCite citator that identifies cases that, while still good law themselves, rely on cases that have been overruled or otherwise undermined.⁸³ Finally, the statutes and regulations tool “allows users to compare current and historical versions of statutes and regulations to see specifically what language has changed version to version.”⁸⁴

LexisNexis has recently been experimenting with chatbots that aim to turn legal research into a conversation.⁸⁵ For example, their “Legal Research

77. See Lyle Moran, *ROSS Intelligence Will Shut Down Amid Lawsuit from Thomson Reuters*, ABA JOURNAL (Dec. 11, 2020), <https://www.abajournal.com/news/article/ross-intelligence-to-shut-down-amid-thomson-reuters-lawsuit>.

78. *You Ask a Question . . . Lexis Answers Understands It*, LEXISNEXIS, <https://www.lexisnexis.com/pdf/lexis-advance/Lexis-answers.pdf> (last visited Apr. 25, 2022).

79. See *How WestSearch Plus Works*, WESTLAW <https://legal.thomsonreuters.com/en/products/westlaw-edge/westsearch-plus> (last visited Apr. 25, 2022).

80. Theresa Tarves, *AI in Legal Education*, in LAW LIBRARIANSHIP IN THE AGE OF AI 50, 107 (Elyssa Kroski ed., 2020).

81. *Id.* at 108-09.

82. *Id.*

83. *Id.* at 109.

84. *Id.*

85. Robert Ambrogi, *Chatbots are Coming to Lexis Advance to Help Guide Your Legal Research*, LAWSITES (Feb. 6, 2019), <https://www.lawnext.com/2019/02/chatbots-coming-lexis-advance-help-guide-legal-research.html>.

Assistant” tracks and displays previous searches in a sidebar and suggests ideas for refining one’s search.⁸⁶ Bloomberg Law also includes an AI searching tool called “Points of Law.”⁸⁷ Points of Law works by:

[I]dentif[ying] key legal language in a case and mak[ing] a generalized statement of law. It then allows users to see the top three cases cited for a particular point of law at issue and see related points of law that courts frequently cite that have referenced the original point that the user is viewing. Users can also run a Points of Law search to find all points of law based on the user’s search.⁸⁸

Multiple legal research platforms are also using AI to change the way attorneys conduct searches from the start. While traditional legal research begins with a search box, brief analyzers and tools like them use AI to analyze entire documents to determine the main legal issues and suggest supporting authorities.⁸⁹

One company that has made particular use of this sort of technology is Casetext. Their AI-powered research assistant, dubbed CARA AI, allows attorneys to drag and drop a document into the system, which then suggests “on-point legal resources based on the facts, legal issues, and jurisdictional information the machine extracts from [the] document.”⁹⁰ Attorneys can also supplement this research by including keywords and Boolean operators.⁹¹ Thousands of law firms have adopted Casetext, including such big names as Quinn Emanuel, Fenwick & West, DLA Piper, and Baker Donelson.⁹²

“The results are more precise because they are based on CARA’s ‘understanding’ of the language in the document. Boolean and keyword search alone lack the kind of pattern recognition and context that CARA provides. In addition to surfacing on-point cases, CARA can also harvest results from databases containing other materials such as briefs, holdings, black-letter law, and analysis.”⁹³

86. *Id.*

87. Tarves, *supra* note 80, at 109.

88. *Id.*

89. Robert Ambrogi, *For Legal Research, Brief Analysis is the New Vogue*, ABOVE THE LAW (Jul. 22, 2019), <https://abovethelaw.com/2019/07/for-legal-research-brief-analysis-is-the-new-vogue/>.

90. Valerie Craige, *Law Libraries Embracing AI*, in LAW LIBRARIANSHIP IN THE AGE OF AI 50, 62 (Elyssa Kroski ed., 2020).

91. *Id.* at 62.

92. *Id.*

93. *Id.* at 62-63.

Westlaw Edge, Lexis Advance, and Bloomberg Law also each recently released some form of brief analyzer tool.⁹⁴ With minor differences, these tools and others on the market aim to provide many of the same functions as CARA.⁹⁵ These tools aim to make legal research more targeted and efficient by using documents that put the full legal issue into context as the basis for the search instead of a few keywords or a sentence.⁹⁶ Essentially, brief analyzers, especially the more advanced ones like CARA, allow attorneys to search using complex legal concepts and arguments as “search terms.” These more complex searches may help eliminate human error and weaknesses in search term development to return more sophisticated, on-point results.

Still, one caveat with brief analyzers is that their analysis’s strength is only as good as the document presented to them. If an attorney’s initial draft contains conceptual errors, such as failing to identify a significant issue, the brief analyzer is unlikely to pick that up. Instead, while the analyzer can help to identify additional cases, issues, and arguments when starting from a good baseline, if the initial legal research used in creating the draft brief was flawed, the brief analysis is likely to be flawed as well.

4. Legal Analytics

Another way in which AI is changing law practice is through legal analytics. While small levels of legal analytics are not necessarily dependent on AI, AI’s ability to harness and analyze massive amounts of data has led to a rise in the reliability and breadth of the type of legal analytics available.⁹⁷

Attorneys can use such legal analytics to analyze information in several different categories.⁹⁸ For example, judicial analytics show which arguments a judge is most likely to find persuasive, how often she grants different types of motions, and various other patterns in her judicial rulings.⁹⁹

Other analytic tools provide information on opposing counsel, such as experience level and win/loss record.¹⁰⁰ Tools also exist that analyze expert

94. Westlaw Quickcheck was released in 2019. Westlaw Quickcheck Judicial, Lexis Brief Analyzer, and Bloomberg Brief Analyzer were released in 2020. Jean O’Grady, *What’s Hot and What’s Not*, DEWEY B STRATEGIC BLOG (March 21, 2021), <https://www.deweybstrategic.com/2021/03/2020-whats-hot-and-whats-not-bloomberg-brief-analyzer-and-thomson-reuters-quickcheck-judicial-tied-for-best-new-workflow-product.html>.

95. *Id.*

96. Robert Ambrogi, *Bloomberg Law Releases Brief Analyzer, Tool that Uses AI to Review Briefs*, LAWSITES (February 19, 2020), <https://www.lawnext.com/2020/02/bloomberg-law-launches-brief-analyzer-tool-that-uses-ai-to-review-briefs.html>.

97. *See generally*, Osbeck, *supra* note 54, at 92-96 (describing various legal analytics tools that rely on AI).

98. *Id.*

99. *See Tarves, supra* note 80, at 110.

100. *See id.*

witnesses “to determine how frequently an expert has been challenged and whether or not their testimony has been excluded or admitted.”¹⁰¹

5. *Legal Writing*

Arguably the most revolutionary use of AI in legal technology, and the one that encroaches most on the legal tasks that lawyers think of as fully dependent on humans, is AI-powered legal writing technology. In particular, technology now exists that can drastically reduce the time it takes to write a motion brief or provide written responses to a complaint.

Casetext, the same company that created CARA, has been a pioneer in this area as well. Released in February 2020, Casetext’s Compose software allows attorneys to select from a library of common motions such as motions to dismiss and motions to strike an expert witness. The attorney inputs a small amount of information such as the names of the parties and which side they are representing. Compose then provides suggested legal standards and case explanations from which the attorney can choose.¹⁰² As the attorney selects the various rules and explanations, they are inserted directly into the motion brief draft. Within minutes, the attorney can draft the initial rules and rule explanation sections for a traditional CREAC.¹⁰³ Further, they can even find analogous cases to assist with their analysis by simply typing in the first sentence of an argument.¹⁰⁴

Another company at the forefront of the recent foray into AI-powered legal writing is LegalMation. LegalMation produces a complaint analysis tool that can read a complaint and create documents like answers, requests for production, interrogatories, and deposition notices that attorneys can customize for their firms.¹⁰⁵ The company, whose software has been adopted by Wal-Mart, has a tagline boasting that it offers “A Day’s Work in Two Minutes.”¹⁰⁶

A full discussion of the pros and cons of each of these types of technologies merits a far more in-depth discussion than can be covered in one law review article alone. The important takeaway for readers of this article is: the

101. *Id.*

102. *Quick Overview*, COMPOSE (2020), <https://compose.law/wp-content/uploads/2020/06/2-page-overview.pdf>.

103. CREAC is one of the traditional acronyms used by legal writing professors to describe the format of an argument in a brief. It stands for conclusion, rule, explanation, analysis, and conclusion.

104. *Quick Overview*, *supra* note 102.

105. *Platform Overview*, LEGALMATION, <https://www.legalmation.com/> (last visited Feb. 17, 2021).

106. *LegalMation Partners with Walmart to Provide Ground-breaking Litigation A.I. Solution to Lower Litigation Costs*, LEGALMATION (Apr. 12, 2017), <https://www.legalmation.com/legalmation-partners-with-walmart-to-provide-ground-breaking-litigation-a-i-solution-to-lower-litigation-costs/>.

AI revolution is no longer “on the horizon;” it is here. Technological developments can only be expected to accelerate in the coming years, and attorneys will need to be on top of them to avoid being replaced by them. Law schools have a role to play in ensuring that law students are not thrown into the deep end when they enter practice, especially since they may need to use or understand this technology right away.

IV. HUMANICS: THE ROBOT-PROOF LEARNING MODEL

“If the work of tomorrow demands more from us, we must demand more from our education.” – Joseph E. Aoun¹⁰⁷

Legal scholars have begun exploring ways in which legal education can adjust to ensure that students have the tools they need to compete in an increasingly computerized world. Multiple scholars have argued for some type of technology requirement in law schools.¹⁰⁸ Others have emphasized the need for stronger “emotional intelligence” skills, which are presumed to be harder for computers to replicate.¹⁰⁹ Still others look to devise a pedagogy that combines these skills, emphasizing the need for both technological and human skills as well as a focus on creativity and ingenuity.¹¹⁰ This article adds to the literature in this latter vein.

In his book, *Higher Education in the Age of Artificial Intelligence*, Joseph E. Aoun argues convincingly that as society moves into the digital age and computers become more capable of doing jobs previously thought fit only for humans, current modes of higher education must adjust.¹¹¹ Says Aoun,

“A robot-proof model of higher education is not concerned solely with topping up students’ minds with high-octane facts. Rather, it

107. See Aoun, *supra* note 2, at 47.

108. See, e.g., Iantha M. Haight, *Digital Natives, Techno-Transplants: Framing Minimum Technology Standards for Law School Graduates*, 44 J. LEGAL PROF. 175 (2020); Kristen E. Murray, *Take Note: Teaching Law Students to be Responsible Stewards of Technology*, 70 CATH. U. L. REV. 201 (2021); Emily Janoski-Haehlen & Sarah Starnes, *The Ghost in the Machine: Artificial Intelligence in Law Schools*, 58 DUQ. L. REV. 3 (2020).

109. See, e.g., Alyson Carrel, *Legal Intelligence Through Artificial Intelligence Requires Emotional Intelligence*, 35 GA. ST. U. L. REV. 1153 (2019).

110. See also R. Amani Smathers, *T-Shaped Lawyer*, AMANI SMATHERS: TECHNO[LAW]GICC (Jan. 29, 2016), <http://www.amanismathers.com/technolawgic/2014/2/21/t-shaped-lawyer>; One model that has been widely-discussed is that of the “T-Shaped Lawyer,” first introduced by Amani Smathers. Carrel, *supra* note 109, at 1168-70 (describing the history of the concept of the T-Shaped Lawyer and defining a T-Shaped Lawyer as one “who demonstrate a deep understanding of law, complimented by a broader but more shallow understanding of complementary areas such data analytics, process improvement, and technology to meet twenty-first-century clients’ demands.”); ELAINE MAK, *THE T-SHAPED LAWYER AND BEYOND: RETHINKING LEGAL PROFESSIONALISM AND LEGAL EDUCATION FOR CONTEMPORARY SOCIETIES* (2017).

111. Aoun, *supra* note 2.

refits their mental engines, calibrating them with a creative mindset and the mental elasticity to invent, discover, or otherwise produce something society deems valuable. This could be anything at all – a scientific proof, a hip-hop recording, a new workout regimen, a web comic, a cure for cancer. Whatever the creation, it must in some manner be original enough to evade the label of ‘routine’ and hence the threat of automation. Instead of training laborers, a robot-proof education trains creators.”¹¹²

To accomplish this, Aoun argues for the creation of a new framework for higher education, which he deems “humanics.” Humanics is “a new model of learning that enables learners to understand the highly technological world around them and that simultaneously allows them to transcend it by nurturing the mental and intellectual qualities that are unique to humans – namely, their capacity for creativity and mental flexibility.”¹¹³ Under humanics, higher education would focus not just on providing content knowledge but on teaching particular ways of thinking about that content.¹¹⁴

A. THE THREE LITERACIES

The content knowledge particularly relevant to humanics is what Aoun calls the “new literacies.”¹¹⁵ The new literacies include technological literacy, data literacy, and human literacy.¹¹⁶

Technological literacy involves understanding how the technology we are using works.¹¹⁷ In particular, Aoun argues that “everyone should be conversant in” coding, which he calls the “lingua franca of the digital world.”¹¹⁸ While the younger generations of students have grown up surrounded by technology and know how to use much of it, they do not necessarily understand why it works the way it does. Aoun argues that this knowledge is necessary because it “empowers us to deploy software and hardware to their fullest utility, maximizing our powers to achieve and create.”¹¹⁹

112. *Id.* at xviii.

113. *Id.* at 53.

114. *See id.* at 53-54. Such a formulation may sound familiar to anyone who has ever been a law student. From the day students enter law school, they are told that they are there to learn not just the law, but how to think about it. Law schools have repeated the mantra that they teach students to “think like a lawyer” practically since law schools have existed. Indeed, in many respects, law schools are particularly well-positioned to adjust to the realities of the digital age because the profession itself has, until recently, not one that lent itself to the kind of routinization that has threatened some other professions.

115. *Id.* at 54.

116. *Id.* at 55.

117. *See id.*

118. *Id.*

119. *Id.*

Data literacy is “the capacity to understand and utilize Big Data through analysis.”¹²⁰ Computers have given us the power to capture huge amounts of data. But, as Aoun points out, “There is little use in accumulating massive amounts of data unless we can arrange it into usable information and thence into understanding.”¹²¹ This is where data analysis comes in, and data literacy would provide students with the tools necessary to examine data and make predictions as well as to know when data is flawed. Not all data is created equal and the misinterpretation of it can lead to misleading outcomes.¹²² Thus, students should be taught “to read the digital record and also to understand when we ought to look elsewhere.”¹²³

“Human literacy equips us for the social milieu, giving us the power to communicate, engage with others, and tap into our human capacity for grace and beauty.”¹²⁴ Skills necessary to develop human literacy include the ability to communicate and collaborate with others from a variety of different backgrounds, the ability to understand other people’s behaviors, and the ability to analyze ethical dilemmas – including those caused by the proliferation of technology itself.¹²⁵ For example, Aoun notes, “The old trolley problem – do you swerve a moving vehicle into a crowd of bystanders, or do you doom its occupants? – is now a very material question for the makers of autonomous vehicles.”¹²⁶ To answer questions like these, he says, we “need philosophers as well as lawyers.”¹²⁷ I would take this a step further and say that we need lawyers who are philosophers.

B. THE FOUR COGNITIVE CAPACITIES

In addition to the three new literacies, Aoun lays out four cognitive capacities that he believes higher education must focus on to help students to become “robot-proof.” The four cognitive capacities are critical thinking, systems thinking, entrepreneurship, and cultural agility.¹²⁸

Aoun defines critical thinking as the ability to “analyz[e] ideas skillfully and then appl[y] them fruitfully.”¹²⁹ Critical thinking has multiple “layers”: “Some of these are quantifiable forms of thinking, like understanding and applying facts to a question. Others are inchoate, even intuitive, such as envisioning how people’s motivations, emotions, and histories influence

120. *Id.* at 57.

121. *Id.*

122. *See id.* at 58.

123. *Id.*

124. *Id.* at 58-59.

125. *See id.* at 60-61.

126. *Id.* at 60.

127. *Id.* at 61.

128. *Id.* at 62.

129. *Id.*

them.”¹³⁰ Machines can do some of this; indeed, “[i]f a problem can be reduced to a train of yes and no questions, no matter how complex, then a machine can resolve it.”¹³¹ Only humans, though, are capable of factoring in not only such yes and no responses but also their context in the wider world.¹³²

Systems thinking involves the ability to apply information gleaned from one domain onto another – to see that most ‘effects’ have multiple potential causes and to analyze how potential solutions to one problem might affect other aspects of the system.¹³³ According to Aoun, “It sees the details and the entire tableau, exercising our mental strength to weigh complexity while also testing our grasp on multiple strands of thought.”¹³⁴

The third cognitive capacity, entrepreneurship, means having an “innovative mindset,” including, but not limited to, the ability to recognize opportunities for “new ventures and industries.”¹³⁵ This may involve the creation of start-ups or new jobs or simply developing new ways of doing current jobs.¹³⁶ Further, to help foster such a spirit, opportunities to fail and to learn from failure are essential.¹³⁷ Additionally, research should be encouraged as “a form of intellectual entrepreneurship.”¹³⁸

Finally, the fourth cognitive capacity is cultural agility. Cultural agility is “the mega-competency that enables professionals to perform successfully in cross-cultural situations.”¹³⁹ The ability to work with individuals from a variety of backgrounds and cultures is essential in an increasingly globalized and tech-connected world.¹⁴⁰ Further, cultural agility is one of the cognitive capacities that most differentiates humans from machines requiring “empathy, discretion, and a very human nuance.”¹⁴¹

In addition to his model of humanics, Aoun spends significant time extolling the virtues of experiential education and explaining how important it is to develop the three literacies and four cognitive capacities.¹⁴² Indeed, Aoun argues that “a humanics education catalyzed by experiential learning

130. *Id.* at 63.

131. *Id.*

132. *See id.* at 64 (“[H]umans are alone in their ability to assess both sides of the critical thinking coin – data analysis and context – and say, ‘This plan will or won’t work.’”).

133. *See id.* at 65-66.

134. *Id.* at 66.

135. *Id.* at 67.

136. *See id.*

137. *See id.* at 69-70.

138. *Id.* at 70.

139. *Id.* (quoting PAULA CALIGIURI, CULTURAL AGILITY: BUILDING A PIPELINE OF SUCCESSFUL GLOBAL PROFESSIONALS 4 (San Francisco: Jossey-Bass, 2012)).

140. *See Aoun, supra* note 2, at 70.

141. *Id.*

142. *See generally id.* at 77-110 (describing how experiential education reinforces a pedagogy of humanics).

is the surest route to a robot-proof future.”¹⁴³ Thanks in part to significant changes in the ABA Law School accreditation rules over the past decade, law schools have made significant headway in developing meaningful, continuous opportunities for experiential education for their students. Still, without commensurate changes in the curriculum that take into account new learning capacities, such as those discussed in this section, students may not be able to take full advantage of what their experiential opportunities could provide.

So, how might law schools integrate such literacies and cognitive capacities into the law school curriculum? A full humanics-inspired re-working of the law school curriculum is beyond the scope of this article. However, in the following section, I provide a microcosm of what such a curriculum might look like, as well as an example of how to integrate legal technology into the school of law curriculum more generally, by describing my humanics-inspired “Law Practice Technology” course.

C. AN EXAMPLE OF A HUMANICS-INSPIRED LEGAL TECHNOLOGY COURSE

I began teaching legal technology for the first time in Spring 2020. In many ways, I was not an obvious candidate for this position. Coming of age as a late Gen X-er, I have used technology for most of my adult life, so I am not exactly a Luddite. However, neither am I particularly tech-savvy; I am a mid-to-late-adopter when it comes to new technology, I cannot code, and I used to even consider myself tech-skeptical.

Still, as a law librarian, I have long been surrounded by people who care greatly about technology. The Law Librarian profession has been at the forefront of implementing technological innovation for some time, partly out of necessity; as legal research has changed, so has the role of law librarians, and to stay relevant, the profession had to adjust. Much of this adjustment has included developing expertise in technology-related areas.

While I cannot pinpoint exactly when it happened, at some point, I realized which way the winds were blowing in terms of the effects of technology on the legal profession. I became convinced that it was essential for law students to learn about technology sooner rather than later. I felt this was particularly important at a school like mine, the University of North Dakota (UND) School of Law, where many of our graduates go on to practice in small firms or solo practices in small cities or rural communities. Unlike those who begin their careers in large firms and/or major cities, our graduates might not have the chance to be exposed to new legal technologies unless they were the ones introducing them.

143. *Id.* at 109.

Because my course was the first of its kind at UND and because of my technical limitations, I decided to create a broader survey-type course rather than something more specific, like “Coding for Lawyers.” The course goals and pedagogical methods that I chose align fairly closely with the educational model of humanics set out in *Robot-Proof*.

Recall that humanics emphasizes three new literacies: technological literacy, data literacy, and human literacy.¹⁴⁴ It also emphasizes four cognitive capacities: critical thinking, systems thinking, entrepreneurship, and cultural agility.¹⁴⁵ No one course can cover all of these areas in-depth, of course. Further, since my goal was to bring something new to the table, I wanted to especially focus on those areas that might not already be being covered deeply in the traditional law school curriculum and that were particularly suited to a course about legal technology. Thus, I chose to focus on two of the key literacies, technological literacy and human literacy. Still, I tried to incorporate aspects of all of the literacies and cognitive capacities into the course.

To help teach technological literacy, I provide students with exposure to multiple types of legal technology as well as the chance to learn some applied skills. Students watch and/or participate in demonstrations on specific legal technologies like case management platforms,¹⁴⁶ e-discovery software,¹⁴⁷ and new legal research and writing tools.¹⁴⁸ Other class discussions or demonstrations are devoted to cybersecurity, document automation, automated contract review, courtroom technology, and more. Additionally, in both Spring 2021 and Spring 2022, the ABA TechShow¹⁴⁹ held its conference virtually and provided a very steep discount to law students; thus, I have been able to require my students to attend portions of the conference where they can attend demonstrations on legal technologies of their choice.

Students also learn about the “technology behind the technology.” Much of the new legal technology is based on artificial intelligence and data analytics. Thus, I devote one class near the beginning of the semester to providing a broad overview of AI, big and small data, and the ethical issues implicated by both. Obviously, one class on AI and data analytics is not intended to make anyone an expert in these areas; instead, the goal is to provide some baseline knowledge and define common terminology that I am then able to

144. Aoun, *supra* note 2, at 55.

145. *Id.* at 62.

146. In different semesters, I have hosted virtual speakers from either Clio and SimpleLaw.

147. In different semesters, I have hosted virtual speakers from either Logikcull and Relativity.

148. For example, I typically demonstrate Brief Analyzers from Westlaw, Lexis, or Bloomberg. I also show the students Compose from Casetext.

149. That ABA TechShow is an annual conference focused on legal technology that is typically held in Chicago in early March. See *ABA TechShow 2022*, AM. BAR ASS'N, <https://www.techshow.com/> (last visited Feb. 22, 2022).

refer back to throughout the semester as we engage with specific tools that incorporate such technology.

Because the course is introductory, it focuses on breadth rather than depth. However, I am able to teach the students some applied skills by incorporating modules from the Legal Technology Assessment (LTA).¹⁵⁰ Created by Procertas, the LTA provides training and assessment on Microsoft Word, Excel, and PowerPoint as well as Adobe PDF. Students can earn one of four designations: Beginner, Intermediate, Qualified, or Expert. They may take the assessments as many times as they want before the end of the semester, and I assign points based on their final designation.

Another major component of the course is understanding legal technology's ethical and practical dimensions. We discuss the duty of technological competence in nearly every class session. We also discuss additional relevant duties such as those pertaining to privacy,¹⁵¹ fees,¹⁵² and the unauthorized practice of law.¹⁵³

Another focus of the course is helping students to understand how legal technology affects the humans who use it or in whose service it is used. I devote at least one class session to how legal technology may alleviate or exacerbate access to justice issues. We discuss the potential for technology to either eliminate or embed bias and the importance of attorneys understanding these risks, particularly with artificial intelligence tools.

I am particularly interested in helping students learn how legal technology is being used in the types of firms and the geographic area in which most will practice. To that end, I recently added a new assignment to the course in which students interview local attorneys to learn about how they are using legal technology. Additionally, each year, I end the course by hosting a free legal technology CLE for the local bench and bar, which provides students with both the opportunity to network and the chance to hear the questions and concerns being raised by their future colleagues.

Finally, a major focus of the course is teaching students how to learn and teach about technology. Whatever specific technologies the students learn about in my course could (and probably will) change drastically, even just in the next few years. Further, none of us can predict what might be coming down the pipeline. Every attorney needs to know how to keep abreast of the latest technology. Further, those who can convey what they learn to others and explain how it can enhance practice can make themselves vital contributors to their firm or organization.

150. See *Legal Technology Assessment* (LTA), PROCERTAS, LLC, <https://www.procertas.com/products/lta/> (last visited Feb. 22, 2022).

151. MODEL RULES OF PRO. CONDUCT r. 1.6 (AM. BAR ASS'N 2021).

152. *Id.* at r. 1.5.

153. *Id.* at r. 5.5.

To help students form the habit of regularly reading and learning about technology, I require them to complete multiple worksheets throughout the semester. These worksheets take the place of a set reading schedule. While I do assign some readings, for the most part I instead ask questions, and students must seek out their own readings, or other resources, to answer those questions. They also must track their time while doing so. This gives them a sense of what it is like to have to “bill” their time. I provide a list of recommended journals, blogs, and podcasts that they may want to consult, but they are also encouraged to look for sources on their own.

To help students learn to teach about technology, they must give a presentation at the end of the semester on a legal technology topic of their choice. When my enrollment is smaller, students give individual presentations; when it is larger, they work in groups. Students have taught one another about everything from using online geospatial data in real estate transactions to choosing the right app for an immigration practice.

Returning to the *Robot-Proof* literacies and cognitive capacities, the key focus of the class is clearly technological literacy. The class is designed to provide students with what is, for many of them, their first taste of legal technology. We also spend significant time cultivating human literacy. Ethics is a substantial portion of the curriculum, and students also have the opportunity to meet multiple legal tech leaders and local attorneys through the various assignments and activities. They also have the opportunity to work together on projects, both as colleagues and as teachers and learners. We do cover the third literacy, data literacy, as well, albeit to a much lesser extent. Our work in data literacy can be seen in our discussions of AI, data analytics, and bias in algorithms.

In terms of the cognitive capacities, I am not sure one could teach a true law-oriented class without focusing, in some respect, on critical thinking. In this class, we exercise both critical thinking and another of the cognitive capacities, systems thinking, in our regular discussions about the pros and cons of various types of legal technologies, who they work for, and what their unintended consequences might be.

I try to instill the beginnings of entrepreneurship in the students by having them take responsibility both for their reading choices, through the worksheets, and through a significant final project presentation on a topic of their choice. I also have a policy of grading more on effort than on output in this course. While output matters, I put significantly more weight on effort than I did when I taught casebook courses or legal writing. I find it particularly important that in a course on new and emerging technologies, students have the opportunity to take chances and, yes, fail – without actually failing.

Finally, we work on cultural agility in the course both through the opportunities to meet and work with others and our in-depth discussions on

topics such as access to justice. Students learn about bias, both implicit and explicit, not only in legal technology but in the legal system itself. We talk about how we can be good stewards of technology, using it to help better the system rather than perpetuate its flaws.

This course is still relatively new, and as I continue to learn and grow in my skills, I continue to make changes and adjustments. The first year I taught it, for example, I had students create and use Twitter accounts where they were expected to tweet at least once a week about a legal technology topic. This was fun, but I found that my capacity to read and comment back on their tweets was limited and my goal of helping them to create online legal technology communities of their own did not quite “take”; I still like the idea but have set it aside until I can find a better way to help them use this tool in the way in which I had hoped they would use it.

Further, I should note that the first year I taught this course was Spring 2020 – and we all know what happened that semester. Midway through the semester, our law school, like many others, went fully online at a time when – hard to even remember it – most of us were not as adept at Zoom as we now are. In Spring 2021, I was still working from home, so I taught the course fully online and had to make certain adjustments to assignments to accommodate that. Thus, Spring 2022 is the first year in which I am teaching the course in exactly the way I initially envisioned it – fully in person.

Interestingly, these shifts in how I had to teach the course and how the students experienced it are examples of the type of experience for which humanics is meant to prepare students. For example, while everyone got a crash course in technological literacy all at once, no doubt those who had some prior experience with things like online education or other uses of videoconferencing adjusted more quickly than others. Similarly, aspects of humanics like human literacy, cultural agility, and entrepreneurship were exactly the kinds of skills that many of us needed to hone as we switched between in-person and online settings and back again. Those who were already self-directed and adept at finding ways to empathize and connect with others even in unusual circumstances went into the unprecedented upheaval of the pandemic with an advantage. Regardless, going from in-person to online and then back again has presented its own challenges for all of us, professors and students alike, so I am still analyzing the aspects of the course that are successful versus those that should be adjusted.

That said, my enrollment this year more than doubled from the past two years, so I believe there is increasing interest in the topic. Whether law schools are fully on board yet, students are showing more and more interest in learning about and understanding legal technology. They seem to know what is coming, and this gives me hope. The more interest law students show

in learning about legal technology, the easier it will be for those of us who believe it is essential to create new and better methods of teaching them.

V. CONCLUSION

Before the COVID-19 pandemic, many law schools were already taking steps to increase their legal technology offerings. The pandemic, and the way in which it forced law firms and courts to embrace technology in ways they had been slower to do before, has accelerated this movement.¹⁵⁴

Because of the varied nature of the types of legal technology instruction offered, it is difficult to say with certainty exactly how many law schools are teaching legal technology and how they are doing it. Still, the Law School Innovation Index,¹⁵⁵ which tracks programs that provide training in law-practice-related innovation, provides some insights. As of this writing, the index looks at the offerings of 50 law schools. Of those 50 law schools, just over half sponsor some type of legal technology-related center, 15 have a JD concentration, and 8 have a clinic.¹⁵⁶ The extent of training provided by these various programs differs greatly, from schools that have dedicated legal technology programs to those that just offer a class or two. Further, the nature of what is taught also varies greatly, and encompasses more than just legal technology, from broad categories such as “Business of Law” to more specific ones, like “Data Analytics.”¹⁵⁷

Still, compared to both law practice and higher education in general, law schools have been slow to recognize the importance of technology education.¹⁵⁸ It is time for this to change. As the educators of tomorrow’s lawyers, law schools must ensure that their students graduate ready for the significant professional challenges that rapidly-changing technology presents.

Of course, not every law school has the resources – human, financial, or otherwise – to create extensive technology programs. However, as I have

154. Victoria Hudgens, *Post-Pandemic, Law Schools See Legal Tech Education Playing an Even Bigger Role*, LAW.COM (July 20, 2021), <https://www.law.com/legaltech-news/2021/07/20/post-pandemic-law-schools-see-legal-tech-education-playing-an-even-bigger-role/> (citing North Carolina Central University School of Law professor and associate dean of technology and innovation April Dawson as saying, “The trend prior to the pandemic and law schools having to move to remote learning was to increase legal tech education anyway,” she said. “But [during] the pandemic, not only law schools but law firms, courts and all of us in the legal profession had to adapt and embrace technology. I think that has accelerated legal educators’ awareness of the significance of tech, legal tech and law school students’ exposure to it.”).

155. Daniel W. Linna, Jr., *Law School Innovation Index*, LEGAL SERVS. INNOVATION INDEX, <https://www.legaltechinnovation.com/law-school-index/> (last visited Feb. 22, 2022). The index tracks other types of programs as well including CLE/Executive Education (11), LLM Concentration (5), Incubators (4), and Initiatives (3).

156. *Id.*

157. *Id.*

158. Simon Canick, *Infusing Technology Skills Into the Law School Curriculum*, 42 CAPITAL U. L. REV. 663, 675 (2014).

shown in this paper, there are things law schools can do now to begin providing this education, with minimal cost. The course I designed provides students with essential exposure to new technologies, while requiring minimal technological knowledge from the instructor. While a broader array of offerings – whether via new courses, externships, cross-listing, or something else – is the eventual goal, this initial course at least lays the groundwork to provide our students with opportunities to learn about new technologies and, hopefully, to spark their interest in learning more.

As every law professor knows, every time a new requirement is added to the curriculum, decisions must be made about what will be eliminated. These are not easy choices, and each law school faculty and administration will need to handle them differently, with an eye toward their mission statement and the community that they serve. Still, these choices must be made. And the time for making them is now.