

DIGITAL NATIVES, TECHNO-TRANSPLANTS: FRAMING MINIMUM TECHNOLOGY STANDARDS FOR LAW SCHOOL GRADUATES*

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Adjustments need to be made to legal education for new attorneys to be ready for the technological demands of legal practice. In 2012, the American Bar Association added a duty of technology competence to the standard for general competence in the Model Rules of Professional Conduct, which has now been adopted by 38 states. The new Comment 8 to Rule 1.1 was an important response to decades of developments in technology that have profoundly affected, and will continue to affect, legal practice. However, like the original duty of competence, the specific elements of the duty of technology competence are rather vague.

Law schools will be most effective in helping students develop the technology skills they need by coalescing around a minimum standard of technology competence skills for all law students. Reviewing the history of the general duty of competence, the development of Comment 8, and the current Model Rules of Professional Conduct, I propose a standard of technology competence for graduating law students that includes technology related to (1) information storage; (2) communication; (3) discovery; (4) research and analysis; (5) marketing; and (6) technology resilience. These six areas include skills and knowledge critical to legal practice, such as cybersecurity, office technology, redaction, algorithms, and artificial intelligence. Although technology training in law schools need not be extensive, a basic curriculum of these skills combined with practice analyzing and adapting to new technology will ensure that newly-minted law school graduates have a solid foundation for their careers.

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INTRODUCTION

*Attorney Error Results in Massive Leak of Privileged Client Data.*¹ *Artificial Intelligence Creeps into Big Law, Endangers Some Jobs.*² *Algorithms Should've Made Courts More Fair: What Went Wrong?*³ In addition to worries about grades, finding a job, national and world politics, and natural disasters, today's law students are worried about technology and how it will impact their futures. Will technology take our jobs? Will we make a technology-related mistake, shaming us forever on an Internet that never forgets, perhaps even resulting in bar disciplinary action? Is technology contributing to the erosion of access to justice? Technology in the practice of law now involves more than just word processing; it affects both the business and mechanics of legal practice and the substance of the law. Imagine the technologies a new attorney will encounter in law practice: knowledge management systems, increasingly sophisticated and opaque legal research databases, Internet marketing and social media platforms, algorithms, and e-discovery tools.

The momentum to add technology- and skills-based training in law schools has been steadily increasing since 2012, when the American Bar Association (ABA) added a technology competence standard for practicing attorneys by adopting Comment 8 for Rule 1.1 of the ABA's Model Rules of Professional Conduct. State bar associations have signaled their support for the new standard; to date, 38 states have incorporated Comment 8 into their Rules of Professional Conduct.⁴ Many law faculty, librarians, and law

1. Catherine M. Chiccine, *Litigation News*, AM. BAR ASS'N (Jan. 22, 2018), <https://www.americanbar.org/groups/litigation/publications/litigation-news/featured-articles/2018/attorney-error-results-massive-leak-privileged-client-data/>.

2. Sam Skolnik, *BLOOMBERG L.* (Jan. 22, 2019), https://www.bloomberglaw.com/document/X2326STG000000?udv_expired=true.

3. Tom Simonite, *WIRED* (Sept. 5, 2019), <https://www.wired.com/story/algorithms-shouldve-made-courts-more-fair-what-went-wrong/>.

4. Robert Ambrogi, *Tech Competence: 38 States Have Adopted the Duty of Technology Competence*, *LAWSITES*, <https://www.lawsitesblog.com/tech-competence/> (last visited Dec. 10, 2019). States continue to adopt the language of Comment 8; the most recent state to adopt the model language as of this writing was South Carolina on November 27, 2019. Other populous adopting states include New York, Ohio, Illinois, Washington, Florida, and Virginia. Although California has not formally adopted Comment 8, California's Standing Committee on Professional Responsibility and Conduct cited

students have increasingly recognized that understanding software and some basic technology principles is critical for competent legal practice. But what does technology competence look like? The language of Comment 8 is understandably vague—the ABA has better things to do than revise the Model Rules every year to adjust for changes in technology.⁵ But that vagueness provides little help for practicing attorneys and law schools who are preparing future attorneys.

Law schools are critically positioned to grapple with this issue. They are preparing the newest crop of attorneys, who as recent graduates should arguably be among the practitioners who have the most familiarity with the latest trends in legal technology. These lawyers should be resources for their firms and organizations in adopting and using new technology, not playing catch-up from their first day on the job.⁶

Law schools will be most effective preparing attorneys when they have a defined standard of technology competence on which to base a curriculum. It is past time to define that standard. Legal educators know the subject matter students need to pass the bar exam—torts, civil procedure, contracts, etc. Likewise, law schools should be on notice as to which technology skills and knowledge new graduates require. Many in the legal field have been thoughtfully discussing this subject for years.⁷ While there will always be more advanced or specialized skills that some students will need and want to develop, law schools should come together in partnership with practicing

Comment 8 in a formal advisory opinion on e-discovery in 2015. State Bar of Cal., Standing Comm. on Prof'l Resp. and Conduct, Formal Op. No. 2015-193.

5. Updating the Model Rules is slow, tedious, and therefore impractical on a frequent basis. As noted in footnote 4, states are continuing to adopt the amended comment years after its adoption by the ABA. But as then ABA President (and later Supreme Court Justice) Lewis Powell remarked in 1965, vague rules are less effective: “[The rules] must lay down clear, peremptory rules in the critical areas relating most directly to the duty of lawyers to their clients and to the courts. This sharpening and clarification of the canons will facilitate more effective disciplinary action and also increase significantly the level of voluntary compliance.” Lewis F. Powell, Jr., *The State of the Legal Profession*, 90 A.B.A. J. 391, 399-400 (1965).

6. “[L]awyer inadequacy is attributable in large part to deficiencies in legal education; and, therefore, the solution is to encourage or to require improvements in legal education that will gradually upgrade the profession.” Roger Cramton, *Lawyer Competence and the Law Schools*, 4 U. ARK. LITTLE ROCK L. J. 1, 2 (1981).

7. See, e.g., Jamie J. Baker, *Beyond the Information Age: The Duty of Technology Competence in the Algorithmic Society*, 69 S.C. L. REV. 557 (2018); Simon Canick, *Infusing Technology Skills Into the Law School Curriculum*, 42 CAP. U.L. REV. 663 (2014); Randy J. Diamond, Darin Fox, Kenneth J. Hirsh, Heidi Frostestad Kuehl & Michael Robak, *Let's Teach Our Students Legal Technology...But What Should We Include?*, AALL SPECTRUM, Sept.-Oct. 2018, at 23; Patricia A. Sallen, *Technology Competence: New Wine in an Old Ethical Bottle*, 42 L. PRACT. 35 (2016); Max Young, *Information Technology: A Role in Legal Education? Where Are We Now?*, 8 INT'L Y.B. L. COMPUTERS & TECH. 75 (1994); Greg Lambert, *What Tech Skills Should Law Schools Teach Future Associates? Step One: The Basics*, 3 GEEKS AND A L. BLOG (October 24, 2016), <https://www.geeklawblog.com/2016/10/what-tech-skills-should-law-schools.html>.

attorneys and the ABA to agree upon a minimum skill set that all graduating law students should possess, regardless of their career plans.

In this paper I will propose a minimum standard for technology competence that can provide a basis for technology education in law schools. The goal is to develop a list of technology skills and knowledge required by law students that is distinct from—though intertwined with—knowledge about law, policy, or ethics. The paper will proceed as follows. In Part I, I briefly discuss the history of the duty of competence and the addition of the duty of technology competence to the Model Rules to place technology skills within the larger rationale for the duty. In Part II, I discuss law students' existing technology skills and discuss how the myth of the "digital native" has impeded technology education. In Part III, I propose a set of minimum technology standards for legal graduates based on current rules of professional conduct and ethics opinions that can provide the basis for a technology curriculum. I hope that these standards will be sufficiently flexible to encompass future changes, but also sufficiently defined to allow for immediate implementation. I have included an appendix summarizing the proposed technology competence standards.

I. THE LEGAL PROFESSION AND THE DUTY OF COMPETENCE

In developing a technology standard, it is worth considering the rationale behind the ABA rule change and the purpose of the duty of competence, ensuring that any adopted technology standards serve the ultimate goals of the profession.⁸ Great pressure already exists on law school curriculum, time, and resources so that only the strongest reasons can justify adding new content. It is not overly difficult to add optional studies in technology, which is the path many law schools have taken thus far.⁹ It is relatively easy to add elective technology-related coursework for students who will work in e-discovery or blockchain to attract law students, give students an edge in the job market, and burnish law school reputations. But a compelling rationale rooted in the goals, spirit, and requirements of the Model Rules is necessary to encourage law schools to move technology training from the periphery of legal education into its core curriculum for all law students.

8. "A true sense of professional responsibility must derive from an understanding of the reasons that lie back of specific restraints, such as those embodied in the Canons... The lawyer who seeks a clear understanding of his duties will be led to reflect on the special services his profession renders to society and the services it might render if its full capacities were realized." *Professional Responsibility: Report of the Joint Conference*, 44 A.B.A. J. 1159, 1159 (1958).

9. See, e.g., Daniel W. Linna Jr. et al., *Law School Innovation Index*, LEGAL SERVICES INNOVATION INDEX, <https://www.legaltechinnovation.com/law-school-index/> (last visited September 9, 2019).

A. A Brief History of the American Bar Association and the Duty of Competence

Standards for competence and professionalism are critical for the legal profession. Like the work performed by doctors, the work performed by lawyers can impact the lives of individuals, families, and businesses for decades.¹⁰ The ABA cited the need to protect the bar from “the corroding and demoralizing influence of those who are controlled by graft, greed and gain, or other unworthy motive”¹¹ when it adopted the precursor to the current Model Rules of Professional Responsibility, the Canons of Professional Ethics, in 1908. As one might assume, the early ethical rules appear to have been focused on attorneys’ moral reputation. We now take the existence of these ethical rules for granted, but as James M. Altman wrote:

There was nothing necessary about the A.B.A.’s promulgation and adoption of a normative statement regarding lawyer conduct. The A.B.A. was formed in 1878 “as an exclusive social fraternal organization of high-status lawyers.” Although on a few occasions during the 1890s the A.B.A. Committee on Legal Education and Admission to the Bar commented on the importance of legal ethics, there was no suggestion to promulgate a code of legal ethics for almost forty years.¹²

Without the powerful external forces that bore down on the legal profession around the turn of the twentieth century, a set of national ethical rules governing attorney conduct may not have come into existence.

The years leading up to the 1905 formation of the ABA “special committee to report upon the ‘advisability and practicability’ of the adoption of a code of professional ethics by the Association”¹³ saw the rise of giant, powerful industrial corporations and the concomitant rise of large law firms that

10. See, e.g., *In re Monaghan*, 222 A.2d 665, 676 (Vt. 1966) (Holden, C.J., dissenting) (“Attorneys are officers of the court appointed to assist the court in the administration of justice. Into their hands are committed the property, the liberty and sometimes the lives of their clients. This commitment demands a high degree of intelligence, knowledge of the law, respect for its function in society, sound and faithful judgment and, above all else, integrity of character in private and professional conduct.”).

11. Comm. on Code of Prof’l Ethics, *Report of the Committee of Professional Ethics*, 29 A.B.A. REP. 600, 601 (1906).

12. James M. Altman, *Considering the A.B.A.’s 1908 Canons of Ethics*, 71 *FORDHAM L. REV.* 2395, 2402 (2003) (quoting Charles W. Wolfram, *Toward A History of the Legalization of American Legal Ethics – I. Origins*, 8 *U. CHI. L. SCH. ROUNDTABLE* 469, 485 (2001)).

13. *Final Report of the Committee on Code of Professional Ethics*, in 33 *ANN. REP. OF THE AM. BAR ASS’N* 567 (1908), <https://bit.ly/3fyB3rj>.

focused almost exclusively on providing services to those corporations.¹⁴ Along with the growth of the large American corporation came a population explosion in urban areas, as workers, many of them immigrants, congregated in cities for employment opportunities.¹⁵ Concerns arose that lawyers were no longer representing the interests of the community but had sold themselves out to the interests of their corporate clients.¹⁶ In June 1905, United States President Theodore Roosevelt gave an influential speech at Harvard University's commencement exercises criticizing corporate attorneys for what he saw as unethical conduct in the pursuit of greed.¹⁷

In addition, there was a concern that solo attorneys practicing in the cities were no longer being policed by the social forces of the local village bar. Unethical attorneys in cities could maintain a thriving practice despite their bad actions because of the ability to hide their misdeeds without the policing force of local gossip or because they "were indifferent to the ostracism of their fellow attorneys."¹⁸ There were also concerns, exemplified by Roscoe Pound's 1906 speech before the ABA's annual convention, "that there was a 'real and serious dissatisfaction' with courts and 'a lack of respect for law ...in the United States today.'"¹⁹ The ultimate purpose of the Canon of Ethics, therefore, according to the special committee, was to "place the profession...before the public in its true light, and thereby free it from the unmerited public criticism and censure which have at times been bestowed upon it by the unthinking, as a result of the misconduct of the small percentage of

14. Altman, *supra* note 12, at 2406.

15. See M. Craig Brown & Barbara D. Warner, *Immigrants, Urban Politics, and Policing in 1900*, 57 AM. SOC. R. 293, 294-95 (1992).

16. Altman, *supra* note 12, at 2406.

17. *Id.* at 2409.

18. John M. Tyson, *A Short History of the American Bar Association's Canons of Professional Ethics, Code of Professional Responsibility, and Model Rules of Professional Responsibility: 1908-2008*, 1 CHARLOTTE L. REV. 9, 11 (2008) (citing *Report of the Committee of Professional Ethics*, 29 A.B.A. REP. 600, 601 (1906)).

19. John M. Barkett, *From Canons to Cannon*, in A CENTURY OF LEGAL ETHICS: TRIAL LAWYERS AND THE ABA CANONS OF PROFESSIONAL ETHICS 161, 163 (Lawrence J. Fox, Susan R. Martyn & Andrew S. Pollis eds., 2009) [hereinafter A CENTURY OF LEGAL ETHICS]. At the time he gave the speech, Roscoe Pound was the Dean of the University of Nebraska College of Law. He argued that American lawyers had turned the law, particularly the rules of civil procedure, into "a mere [football] game," where "[i]f any material infraction is discovered, just as the football rules put back the offending team five or ten or fifteen yards, as the case may be, our sporting theory of justice awards new trials, or reverses judgments, or sustains demurrers in the interest of regular play." *Id.* at 164-165. The result of this gamemanship "is not only to irritate parties, witnesses and jurors in particular cases, but to give the whole community a false notion of the purpose and end of law." *Id.* at 165.

unworthy men who steal into its ranks, yet who in no way represent its spirit or *morale* [sic].”²⁰

Furthermore, the ABA special committee also stated that the rules should “serve as a guide to the youthful practitioner.”²¹ Thus, since the American Bar Association first promulgated ethical rules,²² education was considered a crucial purpose of the rules. An important rationale behind the extensive 1969 revision of the Canons was “that the old canons were not an ‘effective teaching instrument, giving no guidance to the young lawyer beyond their language.’”²³

The original version of the Canon of Professional Ethics did not contain an explicit duty of competence.²⁴ The duty of competence was added when the Canons of Professional Ethics was completely revised in 1969 and renamed the Code of Professional Responsibility.²⁵ The new Canon 6, “A Lawyer Should Represent a Client Competently,” provides in DR 6-101(A):

A lawyer shall not:

- (1) Handle a legal matter which he knows or should know that he is not competent to handle, without associating with him a lawyer who is competent to handle it.
- (2) Handle a legal matter without preparation adequate in the circumstances.
- (3) Neglect a legal matter entrusted to him.²⁶

Canon 6 leaves the duty to assess competence to individual attorneys on a matter-by-matter basis. It is unfortunate that Canon 6 conflates competence with adequate preparation and neglect. An attorney may be perfectly competent but incredibly neglectful. Young attorneys could wrongly assume that

20. *Final Report of the Committee on Code of Professional Ethics*, *supra* note 13, at 569.

21. *Id.* “The American Bar Association canons were designed to serve as general educational guides to proper professional conduct.” John F. Sutton, Jr., *Guidelines to Professional Responsibility*, 39 TEX. L. REV. 391, 405 (1961).

22. “We were...always conscious of the educational role of the Model Rules.” E. Norman Veasey, *Chair’s Introduction, Commission on Evaluation of the Rules of Professional Conduct (“Ethics 2000”)*, in MODEL RULES OF PROF’L CONDUCT xxi, xxii (AM. BAR ASS’N 2013).

23. RAYMOND L. WISE, *LEGAL ETHICS* 8 (2d ed. 1970).

24. CANONS OF PROF’L ETHICS (AM. BAR ASS’N 1908); WISE, *supra* note 23, at 85. “The clear implication of the old canons was that if [a lawyer] accepted a matter he should feel he was or could readily become competent to handle it.” *Id.*

25. “The Model Code was the legal profession’s first attempt to make competence compulsory.” Edmund B. Spaeth, Jr., *To What Extent Can a Disciplinary Code Assure the Competence of Lawyers?*, 61 TEMP. L. REV. 1211, 1218 (1988) (citation omitted).

26. CODE OF PROF’L RESPONSIBILITY AND CANONS OF JUDICIAL ETHICS (AM. BAR ASS’N 1969). A DR is a disciplinary rule.

large expenditures of time and effort are necessary or sufficient for competence. The ethical considerations²⁷ provided for Canon 6 shed some additional light, explaining that competence involves proficiency and continuing legal education.²⁸ Yet nowhere to be found is a definition of competence. In fact, the comments to the American Bar Association's 1979 annotated version of the code state: "The Code contains no definition of competence or guidelines for measuring that quality..."²⁹

When the ABA adopted the new Model Rules of Professional Conduct in 1983, the duty of competence was put front-and-center as Rule 1.1³⁰ and given a definition for the first time: "A lawyer shall provide competent representation to a client. Competent representation requires the legal knowledge, skill, thoroughness and preparation reasonably necessary for the representation."³¹ This vague definition illustrates how difficult it is to craft a meaningful definition of competence.³² As in the case of vague statutes and general common law rules, judicial interpretation is key to understanding. Enforcement, however, is difficult if not impossible with such a vague rule, rendering the duty of competence essentially aspirational.

B. Technology Changes the Rules of Ethics

Enter Comment 8 on technology. In light of the historically fuzzy delineation of competence, the addition of the technology standard in Comment 8 to Rule 1.1 appears miraculously bold and concrete. In 2009, then ABA President Carolyn B. Lamm empaneled the Commission on Ethics 20/20 to evaluate the ABA's Model Rules of Professional Conduct to ensure they

27. The ethical considerations (ECs) were very similar to the current comments to the Model Rules.

28. EC 6-1 states: "Because of his vital role in the legal process, a lawyer should act with competence and proper care in representing clients. He should strive to become and remain proficient in his practice..." CODE OF PROF'L RESPONSIBILITY AND CANONS OF JUDICIAL ETHICS, *supra* note 26, at 23. EC 6-2 provides: "A lawyer is aided in attaining and maintaining his competence by keeping abreast of current legal literature and developments, participating in continuing legal education programs, concentrating in particular areas of the law, and by utilizing other available means." *Id.*

29. ANNOTATED CODE OF PROF'L RESP. 265 (AM. BAR ASS'N 1979). See also Robert B. McKay, *Competence and the Professionally Responsible Lawyer*, 29 EMORY L. J. 971, 972 (1980) ("[T]he Model Code imposes a duty of competence but provides no meaningful definition").

30. "[T]he place of honor, so to speak..." Spaeth, *supra* note 25, at 1220.

31. MODEL RULES OF PROF'L CONDUCT r. 1.1 (AM. BAR ASS'N 1983) (emphasis added). "[U]nder the Model Rules a lawyer's obligation of competence is both more prominently and more vigorously stated than under the Model Code." Spaeth, *supra* note 25, at 1220.

32. "A great difficulty in revising the professional guides is the difficulty of writing guides which are flexible enough to take care of all situations...and at the same time specific enough that lawyers may reasonably know what is expected of them in particular situations involving each level." Sutton, *supra* note 21, at 422.

“keep pace with social change and the evolution of law practice.”³³ After three years of work, the Commission found that the changing technology landscape³⁴ warranted an update to the lawyer’s duty of competence: “Because of the sometimes bewildering pace of technological change, the Commission believes that it is important to make explicit that a lawyer’s duty of competence, which requires the lawyer to stay abreast of changes in the law and its practice, includes understanding relevant technology’s benefits and risks.”³⁵ The ABA approved the amendment of Comment 8’s language (formerly Comment 6) to Rule 1.1 pertaining to competence on August 6, 2012, which now requires that “a lawyer should keep abreast of changes in the law and its practice, *including the benefits and risks associated with relevant technology...*”³⁶

The addition of technology to the ethical duty of competence reflects some of the ABA’s ongoing concerns since the adoption of the original Canons. One of those concerns is attorney efficiency. The Preamble to the 1908 Canons declared that “it is peculiarly essential that the system for establishing and dispensing justice be developed to a high point of efficiency.”³⁷ Furthermore, the ABA Task Force on Lawyer Competency in 1979 determined that lawyer competence “includ[es] the ability to organize and manage legal work.”³⁸ Efficiently organizing and managing legal work requires technology skills.

Economic pressures, while generally left unspoken, are another motivation for changes to the ethical rules.³⁹ Even in 1908, attorneys feared losing work to other competing businesses.⁴⁰ Speaking of the legal profession at the turn of the nineteenth century, Lawrence Friedman wrote in 1973:

33. REPORT OF THE ABA COMMISSION ON ETHICS 20/20, INTRODUCTION AND OVERVIEW I (2012), https://www.americanbar.org/content/dam/aba/administrative/ethics_2020/20120508_ethics_20_20_final_hod_introduction_and_overview_report.pdf.

34. “[T]echnology has irrevocably changed and continues to alter the practice of law in fundamental ways.” *Id.* at 3.

35. *Id.* at 8.

36. MODEL RULES OF PROF’L CONDUCT r. 1.1 cmt. 8 (AM. BAR ASS’N 2018) (emphasis added).

37. *Id.*

38. ABA SECTION OF LEGAL EDUCATION AND ADMISSIONS TO THE BAR, REPORT AND RECOMMENDATIONS OF THE TASK FORCE ON LAWYER COMPETENCY: THE ROLE OF THE LAW SCHOOLS 9-10 (1979) (subdivision (a)(7)).

39. “The drafters of the original Canons, and their forebears, recognized the economic aspects of the practice of law, although they regarded economic motivations as something to be mediated by ethics rules.” Deborah J. Jeffrey, *Ethical Fading*, in A CENTURY OF LEGAL ETHICS, *supra* note 19, at 71, 72.

40. “Competition from outside the profession began to figure as a material element in the economic situation of the bar in the 1880’s.” JAMES WILLARD HURST, THE GROWTH OF AMERICAN LAW: THE LAW MAKERS 319 (1950) (citing title examination and insurance, debt collection, will and trust drafting, tax

Automation and technological change were full of pitfalls for lawyers, no less than for other occupations. Social invention constantly threatened to displace them. Title companies and trust companies proved to be efficient competitors. These institutions were unimportant before the Civil War. But by 1900, large able companies had nibbled away at debt collection, estate work, and title searches, all staples of the practice.⁴¹

Recently, different technologies and industries, in addition to offshore outsourcing, have taken great bites out of such bread-and-butter legal work as document review in discovery and compliance, contract review, and drafting.⁴² From that (cynical or realist?) point of view, the duty of technology competence represents an attempt to keep lawyers evolving and relevant so they can keep their jobs.⁴³ If lawyers do not become more sophisticated users of technology, they will lose work to artificial intelligence, accountants, and cheaper labor overseas.⁴⁴

Perhaps most importantly, changes in technology have greatly impacted compliance with the duty of confidentiality. Like the duty of competence, confidentiality is a core ethical duty for lawyers but did not merit a separate and distinct place in the original Canons.⁴⁵ The ABA adopted the duty of confidentiality as Canon 37 in 1928.⁴⁶ Now that information is stored

advising, and veterans benefits as some of the areas in which non-lawyers competed with lawyers for legal work in the late nineteenth and early twentieth centuries).

41. LAWRENCE FRIEDMAN, *A HISTORY OF AMERICAN LAW* 549-50 (1973).

42. Steve Lohr, *A.I. is Doing Legal Work. But It Won't Replace Lawyers, Yet.*, N.Y. TIMES, Mar. 19, 2017, <https://www.nytimes.com/2017/03/19/technology/lawyers-artificial-intelligence.html>.

43. See, e.g., Melissa Heelan Stanzione, *Lawyers Need to Embrace Legal Tech to Be Competitive*, BLOOMBERG L. (June 4, 2019, 2:57 PM), <https://bit.ly/2XuCX2L>.

44. *Lawyers Beware: The Accountants Are Coming After Your Business*, THE ECONOMIST, Mar. 21, 2015, at 55; Rama Lakshmi, *U.S. Legal Work Booms in India; New Outsourcing Industry is Growing 60 Percent Annually*, WASH. POST, May 11, 2008, at A20; Neil Sahota, *Will A.I. Put Lawyers Out of Business?*, FORBES: COGNITIVE WORLD (Feb. 9, 2019, 10:43 PM), <https://www.forbes.com/sites/cognitive-world/2019/02/09/will-a-i-put-lawyers-out-of-business/#5b23c9a831f0>.

45. The first version of the Canons of Professional Ethics included responsibilities related to confidentiality in the last paragraph of Canon Six ("Adverse Influences and Conflicting Interests"): "The obligation to represent the client with undivided fidelity and not to divulge his secrets or confidences forbids also the subsequent acceptance of retainers or employment from others in matters adversely affecting any interest of the client with respect to which confidence has been reposed." CANONS OF PROF'L ETHICS Canon 6 (AM. BAR ASS'N 1908). See also Susan R. Martyn, *Back to the Future: Fiduciary Duty Then and Now*, in *A CENTURY OF LEGAL ETHICS*, *supra* note 19, at 3, 11 ("Nineteenth-century notions of confidentiality were assumed more often than they were articulated.")

46. *Proceedings of the Fifty-First Annual Meeting of the American Bar Association*, 51 ANN. REP. A.B.A. 29, 130 (1928); *Report of the Special Committee on Supplements to the Canons of Professional Ethics*, 51 ANN. REP. A.B.A. 495, 497 (1928).

on various devices, drives, and cloud servers, and passed across multiple interconnected devices, we have created many points of vulnerability when before there were few—a file cabinet, desk, and perhaps briefcase. Access to those locations was limited to a single locus in the physical world, making them relatively easy to secure. Now, connected devices and servers are susceptible to attack from anywhere the Internet reaches. In addition to the new duty contained in Comment 8 regarding “the benefits and risks” of technology, additions to Rule 1.6 (“Confidentiality of Information”) and related comments also impose new requirements of technology knowledge.⁴⁷ The Commission on Ethics 20/20 considered technology’s impact on confidentiality particularly in relation to communication and storage, and “concluded that technological change has so enhanced the importance of this duty that it should be identified in the black letter of Rule 1.6 and described in more detail through additional Comment language.”⁴⁸ The ABA adopted a new paragraph (c) to Model Rule 1.6 on confidentiality to require that attorneys protect confidential information from “inadvertent or unauthorized disclosure.”⁴⁹ Comment 18 to Rule 1.6 explains that acting competently to protect client information requires lawyers to implement appropriate and reasonable security measures.⁵⁰

Confidentiality, economic pressures, and efficiency are compelling forces that drove the technology-focused amendments to the Model Rules in 2012, and those forces are no less relevant today. Legal work is here to stay, but it has changed and will continue to change as the tools we use to interact with information evolve and as the amount of information available continues to grow.⁵¹ Law is an information profession. It is no surprise that the information revolution of the past twenty-five years has significantly altered legal practice. Now, effective lawyering should be defined as harnessing

47. See MODEL RULES OF PROF’L CONDUCT r. 1.6 cmt. 18 (AM. BAR ASS’N 2018).

48. REPORT OF THE ABA COMMISSION ON ETHICS 20/20, *supra* note 33, at 8. The ABA also made other changes to the Rules to be more expansive in terms of new technology. The ABA expanded the definition of a “writing” by replacing the word “email” in Rule 1.0(n) with “electronic information.” In Rule 1.4 requiring attorneys to return client telephone calls promptly, the ABA replaced the phrase “telephone calls” with “communications.”

49. MODEL RULES OF PROF’L CONDUCT r. 1.6(c) (AM. BAR ASS’N 2018). The full text of subsection (c) reads: “A lawyer shall make reasonable efforts to prevent the inadvertent or unauthorized disclosure of, or unauthorized access to, information relating to the representation of a client.”

50. *Id.* at r. 1.6 cmt. 18.

51. See, e.g., Oliver Goodenough, *Developing an E-Curriculum: Reflections on the Future of Legal Education and on the Importance of Digital Expertise*, 88 CHI.-KENT L. REV. 845, 846 (2013) (“Legal practice isn’t going away; it is just going to forms of delivery that can combine the competence and flexibility of an old fashioned [sic] firm with the efficiency and scale of a just-in-time cloud-computing company.”).

technology effectively and efficiently to understand, communicate, and apply legal information.

C. State Bar Approaches to Comment 8

The ABA has given little guidance to state bars and individual attorneys regarding the implementation of Comment 8. This void has understandably led to a fair amount of discussion.⁵² The ABA provides some resources in the Legal Technology Resource Center (LTRC) on its website, which includes a technology buyer's guide, a blog, and the annual ABA TECHREPORT, but nowhere is there a minimum technology standard for practicing attorneys or law school graduates.⁵³ The duty of competence has always been vague, so this lack of guidance is to be expected. But vagueness only serves to create anxiety among new attorneys and ambivalence among the experienced.

Some state bar associations are trying to fill the void, primarily by adding explanatory language to Comment 8 or issuing advisory opinions. One approach of state bars has been to incorporate additional explanatory language when adopting Comment 8.⁵⁴ For example, New York's version of Comment 8 requires competence in the "technology the lawyer uses to provide services to clients or to store or transmit confidential information."⁵⁵ North Carolina added similar language, requiring competence "with the technology relevant to the lawyer's practice."⁵⁶ Another tactic has been to issue ad hoc ethics advisory opinions that expound upon technology competence. The California State Bar has not adopted Comment 8 into its Rules of Professional Conduct, but in 2012 stated in a formal ethics opinion that an attorney must "have a basic understanding of the protections afforded by the technology she uses."⁵⁷ The opinion also noted that "[a]s technologies

52. See, e.g., Don Macaulay, *What is a Lawyer's Duty of Technology Competence?*, SMART LAW. (Feb. 2, 2018), <http://www.nationaljurist.com/what-lawyers-duty-technology-competence>; Tad Simons, *For a Lawyer, What Does "Technology Competence" Really Mean?* LEGAL EXECUTIVE INST. BLOG (Apr. 20, 2018), <http://www.legalexecutiveinstitute.com/lawyers-technological-competence/>.

53. *Legal Technology Resource Center*, AM. BAR ASS'N, https://www.americanbar.org/groups/departments_offices/legal_technology_resources/ (last visited Feb. 5, 2020). See also Richard K. Herrmann, *Ethics and Technology: Delaware Finds Itself First Again*, FED. LAW., Sept. 2013, at 14 ("Organizations such as the ABA are fairly good at tracking certain ethical topics, such as metadata and cloud computing. But they all lack two important elements: education and guidance, such as best practices.").

54. Baker, *supra* note 7, at 562-564.

55. N.Y. RULES OF PROF'L CONDUCT r. 1.1 cmt. 8 (N.Y. STATE BAR ASS'N 2017).

56. N. CAROLINA RULES OF PROF'L CONDUCT r. 1.1 cmt. 8 (N.C. STATE BAR 2014).

57. State Bar of Calif. Standing Comm. on Prof'l Resp. and Conduct, Formal Op. 2012-184 at 3 (2012).

change, however, security standards also may change” and an attorney “should keep abreast of the most current standards so that she can evaluate” the effectiveness of the technology in maintaining client confidentiality.⁵⁸

Delaware’s approach has been the most ambitious and comprehensive thus far. The Delaware Supreme Court established a Commission on Law & Technology “to develop and publish guidelines and best practices regarding the use of technology.”⁵⁹ The Commission’s website contains a section called Leading Practices, which provides specific guidance on technology topics such as The Cloud, Email, Data Security, eDiscovery, and even Basic Skills such as operating systems and hardware.⁶⁰ In addition to guidance principles, the website links to relevant articles from the Delaware State Bar Association (DSBA) Bar Journal. This website provides a gold standard for technology guidance.

Many bar associations have been understandably hesitant to create specific guidelines because of the short shelf life of technology: defined today, obsolete tomorrow. The Iowa State Bar Association, for example, claimed “[i]t is beyond [our] ability to conduct a detailed information technology analysis... Even if we had that ability our analysis would soon be outdated.”⁶¹ Formulating a technology standard is indeed like shooting at a moving target, but it is possible. The notion that technology changes constantly is an exaggeration. A minimum standard can proscribe basic knowledge that is fairly stable and give attorneys and legal educators a foundation from which to grow and adjust.

D. Comment 8 and Law Schools

ABA standards for legal education have not changed since the adoption of Comment 8, but, as written, they arguably already require technology education. The standards require “a rigorous program of legal education that

58. *Id.* at 4. California also provided extensive guidance on the use of e-discovery in Formal Opinion 2015-193 (2015).

59. *Commission on Law & Technology*, DELAWARE CTS., <https://courts.delaware.gov/declt/> (last visited Feb. 5, 2020).

60. *Commission on Law & Technology: Leading Practices*, DELAWARE CTS., <https://courts.delaware.gov/declt/practices.aspx> (last visited June 17, 2019).

61. Iowa State Bar Ass’n, Ethics Op. 11-01 (2011), quoted in Steven M. Puiszis, *A Lawyer’s Duty of Technological Competence* (presented at the IADC midyear meeting February 21, 2017) 9 (unpublished manuscript), [http://www.iadcmeetings.mobi/assets/1/7/18.2-_Puiszis_\(ETHICS\)_A_Lawyers_Duty_of_Technological_Competence.pdf](http://www.iadcmeetings.mobi/assets/1/7/18.2-_Puiszis_(ETHICS)_A_Lawyers_Duty_of_Technological_Competence.pdf). Puiszis argues, “Given the speed at which technology is evolving, state ethics opinions generally avoid recommending any particular security measure for fear it will be quickly outmoded.” *Id.*

prepares its students . . . for effective, ethical, and responsible participation as members of the legal profession,”⁶² which is dependent on technology knowledge. The ABA’s defined learning outcomes for law students also impliedly include technology competence:

A law school shall establish learning outcomes that shall, at a minimum, include competency in the following:

- (a) Knowledge and understanding of substantive and procedural law;
- (b) Legal analysis and reasoning, legal research, problem-solving, and written and oral communication in the legal context;
- (c) Exercise of proper professional and ethical responsibilities to clients and the legal system; and
- (d) Other professional skills needed for competent and ethical participation as a member of the legal profession.”⁶³

Subparts (b), (c), and (d) directly implicate Comment 8 of Rule 1.1 of the ABA Model Rules. Given that Comment 8 requires attorneys to keep abreast of technology to qualify as competent, it follows that foundational technology knowledge and an ability to monitor and assess new technology is a necessary attribute of law graduates who are prepared for “effective, ethical, and responsible participation” in law practice.

The ABA has not given guidance to law schools on the implementation of Comment 8 in legal education because the new rule focuses on practicing attorneys. The language and placement of the technology clause in a comment devoted to “Maintaining Competence” suggests that the drafters assumed recent law school graduates are competent in technology—that primarily attorneys who have been out of school and practicing for a significant length of time need to take proactive steps to improve their technology skills. It is very possible that members of the ABA Commission on Ethics 20/20 who drafted the new rule believed that current law students are “digital natives” who are adept at using new technology, and experienced practicing

62. AMERICAN BAR ASSOCIATION SECTION OF LEGAL EDUCATION AND ADMISSION TO THE BAR, STANDARDS AND RULES OF PROCEDURE FOR APPROVAL OF LAW SCHOOLS 2017-2018, at Standard 301(A) (2017).

63. *Id.* at Standard 302.

attorneys are digital immigrants who are less so (see discussion in Part II, *infra*). There may be some merit to that belief in terms of technology exposure; some recent graduates will have encountered discussions of newer technologies in undergraduate, graduate, and law programs. The Model Rules as a whole provide guidelines for practicing attorneys, not for legal education, and are therefore directed toward that audience. While several law professors participated in the committee alongside practicing attorneys and judges, considering the impact of technology on legal education was beyond the scope of the Commission's assignment.

While law schools haven't had much assistance from bar associations in developing a technology standard, law schools themselves do not have a rich tradition in technology education. For the most part,⁶⁴ legal educators assumed law students' pre-existing technology skills—primarily the abilities to type, use word processing programs, email, and the Internet—were sufficient to qualify them for legal practice.⁶⁵ Most experimentation with technology during the 1990s and into the 2000s focused on the use of technology in pedagogy, not skills for practice.⁶⁶ The influx of desktop computers and later, laptops, did not precipitate programs in technology training because they were primarily viewed as an in-kind substitute for typewriters. Primarily law librarians and other legal research instructors had to make significant adjustments to accommodate the sea change from print research to

64. Max Young, then Head of the School of Law at the University of Luton in the United Kingdom, noted the lack of technology training in legal education in 1994: "[O]ne main area of legal education that has largely been missed, although there are a few notable exceptions, is that of information technology. One reason for this, perhaps is because of the present structure of legal education... [But] an increasing number of practicing lawyers seem to consider that newly qualified lawyers should have already learnt something of information technology." Young, *supra* note 7, at 76. Richard A. Danner, then Associate Dean for Library and Computing Services at Duke University School of Law, remarked on the need for introductory training "to use the technology effectively . . . in basic applications for word processing, communications, and research." Richard A. Danner, *Facing the Millennium: Law Schools, Law Librarians, and Information Technology*, 46 J. LEGAL EDUC. 43 (1996).

65. "Most law students now arrive at law school already Internet savvy and possessing relatively sophisticated cyberspace navigational skills." Michael Heise, *Closing One Gap But Opening Another: A Response to Dean Perritt and Comments on the Internet*, 33 IND. L. REV. 275, 289 (1999). "Conversations with professors about the possibility of incorporating technology skills into the law school curriculum have revealed a misperception that current students already 'get it.' We see students with laptops in class, we watch them use social media, and we admire their facility with gadgets, but their understanding of technology is shallow." Canick, *supra* note 7, at 665.

66. See, e.g., Richard A. Matasar & Rosemary Shiels, *Electronic Law Students: Repercussions on Legal Education*, 29 VAL. U. L. REV. 909 (1995). Chicago-Kent College of Law has been a leader in the use of technology in legal education for decades.

electronic.⁶⁷ Law schools have only begun incorporating technology into the curriculum in roughly the past decade and then primarily in elective courses.⁶⁸

Some academic legal scholars, nevertheless, had been actively discussing the incorporation of technology skills in legal education years before the adoption of Comment 8,⁶⁹ but the adoption of Comment 8 accelerated the discussion. In 2015, attendees at a conference entitled “Law Schools, Technology, and Access to Justice” agreed to five fundamental principles regarding technology and legal education.⁷⁰ Principle #1 provides:

In their role of ensuring that the lawyers of tomorrow have the core competencies to provide effective and efficient legal services, law schools have the responsibility to provide all students with education and training to enable them to understand the risks and benefits associated with current and developing technologies and the ability to use those technologies appropriately.⁷¹

The other four principles generally relate to technology and access to justice.

A few themes are emerging from law schools’ efforts to engage with technology. Training in office software is becoming commonplace. Casey Flaherty’s Procertas, which grew out of his Service Delivery Review for the evaluation of Kia Motors’ outside counsel,⁷² licenses a Legal Technology Assessment (LTA). The LTA trains, tests, and certifies competence in law practice-related skills in Microsoft Word and Excel, and Adobe Acrobat/PDF and has been adopted by many law schools. Many schools teach classes on e-discovery or law practice management. Some schools have

67. See, e.g., Barbara Bintliff, *From Creativity to Computerese: Thinking Like a Lawyer in the Computer Age*, 88 LAW LIB. J. 338 (1996).

68. For example, in 2013, a survey of law schools’ legal technology instruction had an abysmal 16% response rate (32/203). Camille Broussard, Kathleen Brown, Daniel Cordova & Sarah K. C. Mauldin, *Teaching Legal Technology*, 21 AALL SPECTRUM, Mar.–Apr. 2017, at 22.

69. See Young, *supra* note 7; Danner, *supra* note 64.

70. *Statement of Fundamental Principles*, UMKC SCHOOL OF L.: L. SCHS., TECH. & ACCESS TO L. AND JUST., <https://web.archive.org/web/20150728001711/http://law.umkc.edu/lawtecha2j/statement-of-fundamental-principles> (last visited May 1, 2020).

71. *Id.*

72. *About Procertas*, PROCERTAS, <https://www.procertas.com/about/> (last visited Sep. 19, 2019). While working in Kia Motors’ in-house legal team, Flaherty became concerned about the efficiency of the outside law firms Kia contracted to handle its legal work. Flaherty developed a legal technology audit to test attorneys’ skills using Microsoft’s Word and Excel, and Adobe Acrobat. Attorneys’ performance on the audit was generally poor, leading Kia to require firms with which it does business to improve their performance in order to continue handling Kia’s legal work. *Id.*

participated in hack-a-thons or technology innovation clinics.⁷³ Other schools offer technology-related courses, many focused on the law of technology or new technologies such as blockchain. Nevertheless, almost all technology training and coursework is elective. The success of these programs so far appears quite varied. It is difficult to know how competent students are without a meaningful standard to guide instruction and assessment.

II. THE MYTHICAL DIGITAL NATIVE GOES TO LAW SCHOOL

The term “digital native” has become ubiquitous in both mainstream and academic discussions.⁷⁴ After Marc Prensky coined the term in his 2001 paper *Digital Natives, Digital Immigrants*,⁷⁵ even he was surprised at the life the phrase took on.⁷⁶ Prensky later clarified that he intended the phrase to be a metaphor to describe the general difference in attitude between younger people, who have grown up surrounded by digital technology, and older generations:

The distinction is, I think, much more about culture. It is about younger people’s *comfort* with digital technology, their belief in its ease, its usefulness, and its being generally benign, and about their seeing technology as a fun “partner” that they can master, without much effort, if they are shown or choose to. (They don’t, of course, always choose to.)

Having grown up with digital technology as toys, Digital Natives are much more at ease with its use than the generation that did not. But this surely doesn’t mean they know everything, or even want to.⁷⁷

73. See, e.g., Jessica Miller, *BYU Law Students Create Online Tool to Help Utahns Fight Debt Collectors in Court Without a Lawyer*, SALT LAKE TRIB., Jan. 30, 2018, <https://www.sltrib.com/news/2018/01/30/byu-law-students-create-online-tool-to-help-utahns-fight-debt-collectors-in-court-without-a-lawyer/>.

74. See, e.g., JOHN PALFREY, *BORN DIGITAL: UNDERSTANDING THE FIRST GENERATION OF DIGITAL NATIVES* (2008); JULIE M. ALBRIGHT, *LEFT TO THEIR OWN DEVICES: HOW DIGITAL NATIVES ARE RESHAPING THE AMERICAN DREAM* (2019).

75. Marc Prensky, *Digital Natives, Digital Immigrants*, 9 *ON THE HORIZON*, no. 5, 2001, at 1. See also, Marc Prensky, *Digital Natives, Digital Immigrants, Part II: Do They Really Think Differently?*, 9 *ON THE HORIZON*, no. 6, at 1 (2001). Prensky felt that many scholars, misunderstanding his use of the phrase, unfairly criticized the phrase by packing into it more meaning than he intended. *Id.*

76. Marc Prensky, *Digital Wisdom and Homo Sapiens Digital*, in *DECONSTRUCTING DIGITAL NATIVES: YOUNG PEOPLE, TECHNOLOGY, AND THE NEW LITERACIES* 15, 15-18 (Michael Thomas ed., 2011) [hereinafter *DECONSTRUCTING DIGITAL NATIVES*].

77. *Id.* at 17.

Regardless of Prensky's original meaning, the phrase often now implies that young people in general have a depth and breadth of understanding about how to use technology and how it works that surpasses the knowledge and abilities of the average older person.⁷⁸

Prensky may have succeeded in his goal of creating an elegant metaphor, but he also succeeded in oversimplifying the situation in a way that does a disservice both to youth and mature adults.⁷⁹ Many older adults who have adapted with changing technology over the decades are very open to, and sophisticated about, using new technology, and combine an open attitude with a foundational knowledge about technology they have built over the years.⁸⁰ In contrast, many youth and young adults only know how to use technology for communication, entertainment, and perhaps basic word processing, and have no desire to learn what they need to succeed in the job market. After years of research, it appears that the reality is far more complex, "that there is as much variation *within* the digital native generation as *between* the generations."⁸¹

Perhaps surprisingly, studies have found that in terms of mobile phone usage, Millennials are remarkably similar to older adults. Millennials browse the Internet, take pictures, check email, and play games on their phones at almost the same rates as Generation Xers and Baby Boomers.⁸² Millennials are only slightly more likely than Generation Xers and Baby Boomers to use their phones for other activities besides talking and texting—such as apps.

78. See, e.g., Gregor E. Kennedy & Terry S. Judd, *Beyond Google and the "Satisficing" Searching of Digital Natives*, in DECONSTRUCTING DIGITAL NATIVES, *supra* note 76, at 119. Google's Dictionary defines "digital native" as "a person born or brought up during the age of digital technology and therefore familiar with computers and the Internet from an early age. 'The digital tools that are reshaping our economy make more sense to young digital natives than to members of older generations.'" *Digital Native*, GOOGLE DICTIONARY (last visited Apr. 16, 2020).

79. "This simple typology has exhibited widespread appeal and been influential in the way arguments over the impact of digital technologies on young people have been shaped." Sue Bennett & Karl Maton, *Intellectual Field or Faith-Based Religion: Moving on From the Idea of "Digital Natives"*, in DECONSTRUCTING DIGITAL NATIVES, *supra* note 76, at 169, 170.

80. John Palfrey & Urs Gasser, *Reclaiming an Awkward Term: What We Might Learn from "Digital Natives"*, in DECONSTRUCTING DIGITAL NATIVES, *supra* note 76, at 186, 190.

81. Sue Bennett, Karl Maton & Lisa Kervin, *The 'Digital Natives' Debate: A Critical Review of the Evidence*, 39 BRITISH J. EDUC. TECH. 775, 779 (2008).

82. Experian Marketing Services, *Millennials Come of Age* (2014), <https://millennial-money.com/wp-content/uploads/2015/09/2015-Millennials-Come-of-Age.pdf> (citing the Fall 2013 Simmons National Consumer Study and the Fall 2013 Simmons Connect Study). 89% of Millennials, 90% of Generation Xers, and 87% of Baby Boomers use their phones for mobile browsing during a typical week. 54% of Millennials said they use their phone cameras in a typical week, versus 50% of Generation Xers and 50% of Baby Boomers. 82% of Millennials, 83% of Generation Xers, and 80% of Baby Boomers use email on their phones weekly. And 52% of Millennials, 49% of Generation Xers, and 50% of Baby Boomers use their phones to play a game during an average week. *Id.*

For example, 74% of Millennials use their phones for social networking, versus 69% of members of Generation X and 67% of Baby Boomers.⁸³

Where Millennials differ appreciably from older generations is the sheer amount of time they spend on their phones. The average Millennial spends 14.5 hours per week on her phone.⁸⁴ “Millennials spend so much time on their smartphones that they account for 41 percent of the total time that Americans spend using smartphones, despite making up just 29 percent of the population.”⁸⁵ On average, Millennials spend 67 hours each week using media. Essentially, Millennials are spending a lot of time with their smartphones and using media, but that usage does not equate to skills needed in the workplace. For example, a field study of teenagers in Japan found them adept at using mobile technology to listen to music, watch videos, and communicate with friends, but unprepared to engage with technology critically.⁸⁶ The ability to book a plane ticket or spend hours watching cat videos on YouTube does not equate to the ability to handle a client’s complex e-discovery matter.

Of course, technology consists of more than just smartphones. Evidence suggests that law students are not sophisticated users of the Microsoft Office suite. In 2015, an adjunct law professor assigned his students to take the Microsoft Word module of Casey Flaherty’s Legal Tech Assessment, which tests users’ abilities to edit a document using styles, breaks, footers, and track changes.⁸⁷ The test also requires users to locate and change document metadata. Students’ performance was very poor. “On average, students were able to correctly complete less than a third of the following [thirteen] tasks” in Word.⁸⁸ As William Slomanson pointed out over 20 years ago, “Undergraduate experience provides ample computer knowledge for general purposes, but it doesn’t give students the specific tools they need for legal education.”⁸⁹

The assumption of native technology competency packed into the term “digital natives” harms students when it lulls educators into thinking students

83. *Id.* at 12.

84. *Id.* at 11.

85. *Id.*

86. Toshie Takahashi, *Japanese Youth and Mobile Media*, in DECONSTRUCTING DIGITAL NATIVES, *supra* note 76, at 67, 72-73, 80.

87. Casey Flaherty, *The Myths of the Digital Native (Part 1)*, 3 GEEKS AND A L. BLOG (Oct. 5, 2015), <https://www.geeklawblog.com/2015/10/the-myths-of-digital-native-part-1.html>.

88. *Id.*

89. William R. Slomanson, *Electronic Lawyering and the Academy*, 48 J. LEGAL ED. 216, 225 (1998).

need no additional training in technology to be prepared for the workforce.⁹⁰ While technology ability varies from student to student, the evidence suggests that many students who can use technology in their day-to-day lives are not necessarily prepared to use technology in the practice of law.⁹¹ But there's another danger as well: so-called digital native law students may be more comfortable with technology than their predecessors, and thus more likely to rely on non-transparent computer processes for decision-making.⁹² Law students must be prepared not to rely on these technologies implicitly, but to thoughtfully use, question, develop, challenge, and improve—or else terminate them.

III. TECHNOLOGY-PREPARED LAW SCHOOL GRADUATES: A PROPOSED LIST OF COMPETENCIES

By themselves, Rule 1.1 and Comment 8 give little insight into defining baseline technology competencies for law graduates. However, when combined with the other Model Rules of Professional Conduct, state bar guidance, and scholarly commentary, they supply useful direction. The ABA Commission on Ethics 20/20 Report provides a useful foundation for a technology skills framework by enumerating the facets of legal practice that have been substantially affected by technology.⁹³ From the report, we can extract the following areas of technological competence needed by new attorneys:

- 1) Information Storage
- 2) Communication
- 3) Discovery
- 4) Research and Analysis
- 5) Marketing

90. “While it appears positive and celebratory, this characterization of young people is also strangely belittling: it assumes that young people spontaneously know everything they need to know about technology, rather than having to make the effort to learn about it.” David Buckingham, *Foreword to DECONSTRUCTING DIGITAL NATIVES*, *supra* note 76, at ix, x.

91. “Students’ abilities are oriented toward their personal, social, and educational needs, and may not be well matched with professional skills needed in the practice of law.” Canick, *supra* note 7, at 665. *See also* Bennett, Maton & Kervin, *supra* note 81, at 177 (“[W]hile some young people may be confident in using technology, their understandings of how that technology works and how it might help them *learn* may be extremely limited.” (citations omitted)).

92. *See* discussion in Part III.D, *infra*. *See also* David Armond, *Ask a Director: Artificial Intelligence Trends to Watch in the Legal Industry*, AALL SPECTRUM, Sept.–Oct. 2019, at 29.

93. “Technology affects nearly every aspect of legal work, including how we store confidential information, communicate with clients, conduct discovery, engage in research, and market legal services.” REPORT OF THE ABA COMMISSION ON ETHICS 20/20, *supra* note 33, at 4.

A sixth category is needed to encompass the skills enumerated in Comment 8 (“a lawyer should keep abreast of . . . the benefits and risks associated with relevant technology”)⁹⁴ because thoughtful evaluation of and adaptation to new technology constitutes an additional skill set I will call technology resilience. Thus, the six areas of technology competence are:

- 1) Information Storage
- 2) Communication
- 3) Discovery
- 4) Research and Analysis
- 5) Marketing
- 6) Technology Resilience

As discussed in Part II *supra*, client confidentiality and attorney efficiency are highly intertwined with the duty of competence. Confidentiality and efficiency will thus inform the specific skills needed in each category of technology competence. Furthermore, I approach this skill set as a baseline for attorney technology knowledge, not a ceiling, but at the same time acknowledge that the purpose of law school is to train attorneys, not programmers or information technology professionals. Law schools should continue to offer more advanced training to interested students while ensuring that all students meet the standards for basic technology competence.

These skills are both outward-facing (client-facing) and inward-facing (firm-facing). Attorneys must be competent to protect their own data and information, manage their legal practices and tasks, and also be able to advise their clients to do the same. After the conclusion of this paper, I include an appendix summarizing all of the technology standards proposed in this section.

A. Information Storage

Information storage now goes far beyond paper stuffed into file cabinets, bankers boxes, and briefcases. Information may be digitally stored on many kinds of devices (mobile and stationary), on removable external storage devices, and by third parties, websites, and SaaS (software as a service) providers. Information can be stored in short-term volatile memory or long-term nonvolatile memory. Devices that store data go beyond computers and phones and extend to vehicles, security systems, and even refrigerators, as

94. MODEL RULES OF PROF'L CONDUCT 1.1 cmt. 8 (AM. BAR ASS'N 2018).

the tools we use in daily life become connected to the Internet (also known as the Internet of Things or IoT).⁹⁵ Information storage implicates many aspects of legal ethics and practice, including confidentiality, efficiency, discovery, and preservation, all of which at any given time may conflict with one another. For example, attorneys are required to maintain client confidences but can work more effectively and efficiently when they store client information on a cloud service that can be accessed anywhere. Attorneys therefore must be prepared to make good decisions regarding information storage issues, which can be broken into three categories, (1) Cloud Storage; (2) Information Storage and Maintenance; and (3) Information Security. The key word for all aspects of attorney competence regarding information storage is “reasonableness.”

1. *Cloud Storage*

The use of cloud storage by attorneys has grown steadily, despite increasing at a slower rate than use by businesses and individuals.⁹⁶ The 2019 ABA TECHREPORT found usage of cloud services in the legal world is now around 58%, with heavier usage by solo attorneys and small firms.⁹⁷ Interestingly, “lawyers continued to use popular consumer cloud services like Google Apps, iCloud, and Evernote at higher rates than dedicated legal cloud services,”⁹⁸ perhaps because they are considered easier and cheaper to use. These findings suggest that understanding cloud storage and cloud storage license agreements is very important for attorneys.

Much of the guidance related to information maintenance and storage has focused on cloud storage and has permitted the use of cloud storage, provided reasonable safeguards are in place.⁹⁹ Beyond a knowledge of basic security practices, determining what is reasonable in the use of cloud storage does not require much technical knowledge per se. It is generally a matter of

95. See, e.g., *Fridge Sends Spam Emails as Attack Hits Smart Gadgets*, BBC NEWS, Jan. 17, 2014, <https://www.bbc.com/news/technology-25780908>.

96. Dennis Kennedy, *2019 Cloud Computing*, ABA TECHREPORT 2019 (2019), https://www.americanbar.org/groups/law_practice/publications/techreport/abatechreport2019/cloudcomputing2019/.

97. *Id.*

98. *Id.*

99. See, e.g., Am. Bar Ass’n Standing Comm. on Ethics and Prof’l Resp., Formal Ethics Op. 477 (2017); Ill. Bar Assn., Prof’l Conduct Advisory Op. 16-06 (2016); Fla. State Bar Assn. Comm. on Prof’l Ethics, Opinion 12-3 (2013). For a list of states with ethics advisory opinions regarding cloud computing, see Nicole Black, *Lawyers and Cloud Computing: It’s Not So Complicated Anymore*, ABOVE THE LAW: EVOLVE THE LAW (Apr. 4, 2019, 2:48 PM), <https://abovethelaw.com/legal-innovation-center/2019/04/04/lawyers-and-cloud-computing-its-not-so-complicated-anymore/>.

careful contract reading while keeping some basic principles in mind. These principles include consideration of the following:

- a. Security procedures
- b. Backup procedures
- c. Awareness of where the data is stored and privacy laws and protections of the hosting jurisdiction
- d. Vendor assurances of maintaining confidentiality of the data
- e. Notification of unauthorized access
- f. Ability to retrieve information
- g. Past reliability and reputation of the vendor¹⁰⁰

Attorneys are safest when engaging large, established companies for cloud storage needs; engaging a new cloud storage provider will mean more risk for the attorney, particularly if the decision is made solely to save money or for some other reason apart from procuring advanced security features. Indeed, using a large-scale cloud storage provider that employs a team of security experts is generally a much safer bet than using an in-house solution for all but the very largest of law firms.

2. *Information Storage and Maintenance*

All attorneys use some sort digital file storage. Ethics rules regarding client file retention generally require attorneys to preserve client files for between five to seven years, depending on the state.¹⁰¹ As legal practice increasingly goes paperless, more legal files will be digital only, and storing digital files rather than paper is space- and cost-effective. Data storage principles are also implicated by the rules of evidence, in conducting investigations, and in communications. A basic understanding of data storage is essential to comply with ethical rules. Law school graduates should have a basic awareness of the following:

- a. Data storage locations
- b. Data backup

100. See, e.g., N.Y. State Bar Prof'l Ethics Comm., Op. No. 842 (2010); N.H. Bar Ass'n Ethics Comm., Op. No. 2012-13/04 (2013); Ill. State Bar Ass'n, Prof'l Conduct Advisory Op. No. 16-06 (2016); Or. State Bar Ass'n, Formal Op. No. 2011-188 (2015).

101. ABA Ctr. for Prof'l Resp., *Materials on Client File Retention*, AM. BAR ASS'N, https://www.americanbar.org/groups/professional_responsibility/services/ethicssearch/materials_on_client_file_retention/ (last visited Feb. 4, 2020).

- c. Short-term and long-term storage
- d. Storage costs and stability
- e. Data destruction
- f. Data recovery
- g. Copying and transferring data
- h. Preservation of social media and other ephemeral data
- i. How third-party service providers use data¹⁰²

3. *Information Security*

Issues regarding security require more technical knowledge of attorneys; indeed, security requires the most attention and technical training out of any of the six categories discussed in this paper. As with information storage, ABA and state bar guidance related to security has focused on a reasonableness standard that requires attorneys to analyze situations on a case-by-case basis.¹⁰³ Attorneys cannot judge the reasonableness of security measures without knowing the basics of security best practices. Law firms have not shown the same dedication to protecting information as other for-profit corporations whose viability depends on the protection of trade secrets.¹⁰⁴ The ABA has gone so far as to claim that “[t]he lack of effort on security has become a major cause for concern in the profession.”¹⁰⁵ The knowledge attorneys need is not so much how the security works, but the levels of security that exist and best practices.¹⁰⁶

102. David Armond, *Ask a Director: Safeguarding Privacy & Data*, AALL SPECTRUM, May–June 2018, at 36, 37.

103. The Commission on Ethics 20/20 developed a list of factors to assist attorneys in analyzing the reasonableness of security measures. REPORT OF THE ABA COMMISSION ON ETHICS 20/20, *supra* note 33, at 8. See also JILL D. RHODES & VINCENT I. POLLEY, THE ABA CYBERSECURITY HANDBOOK: A RESOURCE FOR ATTORNEYS, LAW FIRMS, AND BUSINESS PROFESSIONALS 48–49 (2013) [hereinafter ABA CYBERSECURITY HANDBOOK] (“Although security is relative, recent developments suggest that a legal standard for ‘reasonable’ security is emerging. That standard rejects requirements for specific security measures (such as firewalls, passwords, and the like) and instead adopts a fact-specific approach to business security obligations that requires a ‘process’ to assess risks, identify and implement appropriate security measures responsive to those risks, verify that they are effectively implemented, and ensure that they are continually updated in response to new developments.”); ABA Comm’n on Ethics & Prof’l Resp., Formal Opinion 477R (2017); Mass. Bar Ass’n., Opinion 12-03 (Mar. 2012).

104. David G. Ries, *2017 Security*, ABA TECHREPORT 2017 (Dec. 1, 2017), https://www.americanbar.org/groups/law_practice/publications/techreport/2017/security/.

105. Kennedy, *supra* note 96.

106. “Although the Committee does not believe that attorneys must develop a mastery of the security features and deficiencies of each technology available, the duties of confidentiality and competence that attorneys owe to their clients do require a basic understanding of the electronic protections afforded by the technology they use in their practice.” State Bar of Cal. Standing Comm. on Prof’l Resp. & Conduct,

The “Security Tips” section of the U.S. Department of Homeland Security’s Cybersecurity and Infrastructure Security Agency (CISA) has an excellent list of points of general security knowledge.¹⁰⁷ The following list is developed from CISA’s tips and THE ABA CYBERSECURITY HANDBOOK¹⁰⁸:

- a. Proper disposal of electronic devices
- b. Mobile apps privacy
- c. Cybersecurity
- d. Securing network infrastructure
- e. Securing the internet of things (IOT)
- f. Risk assessment
- g. Firewalls
- h. Encryption
- i. Good security habits
- j. Protecting USB drives
- k. Securing wireless networks
- l. Supplementing passwords (two- and multi-factor authentication)
- m. Strong passwords
- n. Bluetooth technology
- o. Software updates and patches
- p. Website security
- q. Securing wireless networks
- r. Client portals
- s. Protecting against ransomware and malicious code
- t. Protecting against social engineering and phishing attacks
- u. Denial-of-service attacks
- v. Attack response and recovery
- w. Natural disaster recovery
- x. Malware
- y. Identity theft

Formal Op. 2010-179 at 5 (2010), <https://www.calbar.ca.gov/Portals/0/documents/ethics/Opinions/2010-179-Interim-No-08-0002-PAW.pdf>.

107. *Tips*, CYBERSECURITY & INFRASTRUCTURE SECURITY AGENCY, <https://www.us-cert.gov/ncas/tips> (last visited Dec. 9, 2019) [hereinafter CISA].

108. ABA CYBERSECURITY HANDBOOK, *supra* note 103, at 33-34. THE ABA CYBERSECURITY HANDBOOK lists eight top considerations for lawyers regarding security: (1) “Develop a comprehensive information security plan,” in which resources are allocated first to “the most critical and vulnerable aspects of the system”; (2) “Conduct a risk assessment” and “ensure . . . continuous monitoring”; (3) “[U]s[e] appropriate encryption technology”; (4) “[U]se Mobile Device Management”; (5) “Only known users and devices should be permitted on the network”; (6) “Develop a data retention and destruction plan”; (7) Have a protocol in place for a data breach; and (8) Develop and prepare a data breach first-responder team. *Id.*

- z. Digital signatures
- aa. Email attachments¹⁰⁹

This list is extensive—but given that in 2017, 22% of responding law firms reported experiencing a data breach to the ABA,¹¹⁰ and that human beings are generally considered the weakest link in any security protocol—these skills are required knowledge for all attorneys.

B. Communication

Communication is “the foundational fiduciary duty for maintaining the client’s trust and control.”¹¹¹ Maintaining secure and frequent communication with clients and other parties is indisputably important. As with information storage, technology knowledge involving communication is intertwined with a knowledge of security principles. Those general principles discussed in Part A *supra* are not repeated here. This section covers the need for law schools to teach basic technology skills related to: (1) email and other electronic communication; (2) redaction; (3) metadata; (4) office software; and (5) e-filing.

1. Email and Other Electronic Communication

In 1999 the ABA deemed unencrypted email sent via the Internet sufficiently secure for general communications because “there is a reasonable expectation of privacy in its use.”¹¹² The ABA reiterated that stance in 2017, but placed much more emphasis on attorneys’ obligation to use encryption in certain circumstances and to make fact-specific determinations on the need for additional security.¹¹³ More sensitive communications warrant the

109. *Id.*; CISA, *supra* note 107. *See also, e.g.*, Daniel Garrie & Rick Borden, *Encryption for Lawyers*, BUS. L. TODAY, Jun. 2016, at 1; N.Y. State Bar Ass’n Comm. Prof’l Ethics, Opinion 1019 (2014).

110. Ries, *supra* note 104.

111. *Williams v. Reed*, 29 F. Cas. 1386, 1390 (C. Ct. Maine 1824) (Story, J.), quoted in Martyn, *supra* note 45, at 9.

112. ABA Comm. on Ethics & Prof’l Resp., Formal Op. 99-413 at 2 (1999).

113. ABA Comm. on Ethics & Prof’l Resp., Formal Op. 17-477R at 5 (2017) [hereinafter ABA Op. 17-477R] (“Thus, the use of unencrypted routine email generally remains an acceptable method of lawyer-client communication. However, cyber-threats and the proliferation of electronic devices have changed the landscape and it is not always reasonable to rely on the use of unencrypted email . . . Therefore, lawyers must, on a case-by-case basis, constantly analyze how they communicate electronically about client matters, applying the Comment [18] factors to determine what effort is reasonable.”

added protection of encryption or a different delivery method, such as a face-to-face conversation.¹¹⁴ Encryption scrambles the contents of a file or email into an unrecognizable form, and the file can be decoded only by someone who has the key.¹¹⁵ Adding encryption to an email is a simple procedure after the necessary certificates are downloaded and the email client configured.¹¹⁶ Attorneys should know the procedure for encrypting email messages. Attorneys should also be familiar with using digital signatures, which can be used to verify that email contents have not been tampered with.¹¹⁷

Furthermore, because communication involves outside parties, attorneys have a duty to ensure as much as reasonably possible that the receiving end of their communications is secure.¹¹⁸ Attorneys must have sufficient knowledge to provide an adequate warning and training to clients who may be technologically unsophisticated.¹¹⁹ Some legal situations are so sensitive—such as those involving domestic violence—that it could be a matter of life or death. This principle also applies to attorneys who use client portals, text messaging, social media, or any other form of electronic communication.

To summarize, law school graduates should understand:

- a. Email encryption
- b. Digital signatures

Encrypting only some messages, however, may be problematic because it signals to hackers which communications they should focus their energies on.)

114. *Id.* (“Reasonable efforts, as it pertains to certain highly sensitive information, might require avoiding the use of electronic methods or any technology to communicate with the client altogether. . .”); ABA Comm. on Ethics & Prof’l Resp., Formal Op. 11-449 (2011).

115. Garrie & Borden, *supra* note 109, at 2. Encryption can be used on stored data as well as communications in transit.

116. See, e.g., *Encrypt Messages by Using S/MIME in Outlook Web App*, MICROSOFT OFF. SUPPORT, <https://support.office.com/en-us/article/encrypt-messages-by-using-s-mime-in-outlook-web-app-2e57e4bd-4cc2-4531-9a39-426e7c873e26> (last visited Jan. 6, 2020); *Sign or Encrypt Emails in Mail on Mac*, APPLE SUPPORT MAIL USER GUIDE, <https://support.apple.com/guide/mail/sign-or-encrypt-emails-mlhlp1180/mac> (last visited Jan. 6, 2020).

117. *Understanding Digital Signatures*, CISA (last revised Nov. 14, 2019), <https://www.us-cert.gov/ncas/tips/ST04-018>.

118. ABA Formal Ethics Opinion 11-459 requires that attorneys warn clients to use a secure email system for confidential communications; this warning is particular important when the client is involved in a workplace dispute and uses a device and email address provided by the employer. ABA Comm. on Ethics & Prof’l Resp., Formal Op. 11-459 (2011); ABA Op. 17-477R, *supra* note 113, at 8.

119. Model Rule 1.4 “requires the lawyer to reasonably consult with the client about the means to be used to accomplish the client’s objectives,” and “means” includes technology. MODEL RULES OF PROF’L CONDUCT r. 1.4 cmt 2 (AM. BAR ASS’N 2018). Attorneys may need to make adjustments to the forms of communication they use, depending on the technological sophistication of the client. ABA Op. 17-477R, *supra* note 113, at 7.

- c. How to explain security and communication protocols to clients

2. Redaction

At times, attorneys need to send documents to third parties or file documents with a court that contain irrelevant confidential information.¹²⁰ Most often this situation occurs during litigation—but not always. Manual redaction with a black marker is ineffective and too slow to handle large amounts of information.¹²¹ All law school graduates should be familiar with the following:

- a. Redacting in Adobe Acrobat
- b. Redacting in e-discovery software
- c. Improper/insufficient redaction methods¹²²

3. Metadata

Metadata is a communications problem rather than an information storage problem because metadata most often becomes consequential when it is accidentally sent to an outside party. Metadata consists of information about documents and other digital objects such as the author and dates of creation or modification. This information is often automatically generated by a software program, but also includes information that is added intentionally such

120. The increasing availability of court records online has made redaction in court filings essential. Previously, when court filings were maintained in courthouse filing cabinets, few people would invest the time and expense to access those records. David S. Ardia, *Privacy and Court Records: Online Access and the Loss of Practical Obscurity*, 2017 U. ILL. L. REV. 1385, 1387; Lynn E. Sudbeck, *Placing Court Records Online: Balancing Judicial Accountability with Public Trust and Confidence: An Analysis of State Court Electronic Access Policies and a Proposal for South Dakota Court Records*, 51 S.D. L. REV. 81, 89 (2006).

121. Text redacted via marker is vulnerable to detection through the use of a scanner, in addition to sometimes being visible by the naked eye when held at the right angle. Mark J. Crandley, *The Perils of Redaction: Simple Steps to Protect Confidential Information*, BARNES & THORNBURG LLP: COM. LITIG. UPDATE May 2015, <https://www.btlaw.com/insights/publications/the-perils-of-redaction-simple-steps-to-protect-confidential-information>. See also, e.g., “Russian Spy” Clip, HIDDEN FIGURES (20th Century Fox 2016), <https://www.youtube.com/watch?v=eEJWtAMnAlA> (last visited Feb. 5, 2020) (Katherine Johnson, played by Taraji P. Henson, is accused of being a spy for discovering classified information by holding redacted documents up to the light).

122. Proper redaction removes the information from the file; improper redaction simply covers over the information, but it still exists in the file and can be recovered. Dean Sappey, *The Courts Have Spoken: Only a True Redaction Tool Will Do*, LAW.COM: LEGALTECH NEWS (Jun. 26, 2019, 7:00 AM), <https://www.law.com/legaltechnews/2019/06/26/the-courts-have-spoken-only-a-true-redaction-tool-will-do/> (last visited Apr. 14, 2020).

as comments and edits recorded in “track changes.”¹²³ Ethics opinions on metadata clarify that the duty of confidentiality carries over to metadata.¹²⁴ Most metadata is innocuous, but plenty of horror stories exist to strike fear into the hearts of law students everywhere.¹²⁵ The knowledge required to comply with metadata obligations consists of:

- a. Definition of metadata
- b. Examples of common metadata types
- c. Location of metadata in commonly used programs
- d. Metadata removal

In addition to its importance in communication, metadata is a powerful research tool. Lawyers and law students use metadata in field and segment searching without realizing it. Metadata is also used in smart contracts tools, library catalogs, content management systems, and e-discovery. In the future, metadata may also replace natural language in documents.¹²⁶ Law students who understand metadata will be prepared to use the legal practice tools of the future.

4. Office Software

Facility with Microsoft Office and Adobe Acrobat is necessary to comply with ABA Model Rule 1.5, which prohibits “charg[ing], or collect[ing]

123. *What is Metadata?*, HARV. L. SCH.: INFO. TECH. SERVICES, <https://hls.harvard.edu/dept/its/what-is-metadata/> (last visited Dec. 12, 2019).

124. *See, e.g.*, ABA Standing Comm. on Ethics & Prof'l Resp., Formal Op. 06-442 (2006) (review and use of metadata); Maryland State Bar Ass'n Comm. on Ethics, Ethics Docket No. 2007-09: Ethics of Viewing and/or Using Metadata (2007), <https://www.msba.org/ethics-opinions/ethics-of-viewing-and-or-using-metadata/> (accessed June 7, 2019); N.H. Bar Ass'n Ethics Comm., Advisory Op. #2008-09/04: Disclosure, Review and Use of Metadata in Electronic Materials (2008), <https://www.nhbar.org/ethics/opinion-2008-09-04> (accessed June 7, 2019); Prof'l Ethics Comm. for the State Bar of Tex., Op. No. 665 (2016), <https://www.legaethicstexas.com/getattachment/74b4a965-d26b-4845-99ff-fc67a10b18d1/Opinion-665> (accessed June 7, 2019).

125. “Though metadata is often of little or no interest, as the D.C. Bar Ethics Opinion observes, ‘in some instances it may reveal significant information.’” J.T. Westermeier, *Recent Ethics Opinion on Metadata Support New Best Practice*, 2009 Emerging Issues 3791 (LEXIS).

126. David M. Blazzkowsky & Matthew Reed, *Meta-what? Lawyers, Legal Training, and the Rise of Meta-data for Digital Securities and Other Financial Contracts*, in EDUCATING THE DIGITAL LAWYER 3-1, 3-5 (Oliver Goodenough & Marc Lauritsen eds., 2012).

an unreasonable fee or an unreasonable amount for expenses.”¹²⁷ Until the billable hour disappears, inefficiency in routine office work is unethical.¹²⁸ Most beginning law students will already be familiar with the basics of these programs, but very few can use (or are even aware of) the more advanced features of these powerful software programs that are commonly used in legal practice.¹²⁹ Legal tech experts generally recommend that all law schools begin their technology training programs with a focus on these software programs.¹³⁰ In addition to being foundational technologies for any legal practice, law schools often already have access to them for their students.¹³¹ Case management software is more difficult to obtain, but important for students to be familiar with. All law graduates should know the following:

- a. Microsoft Office
- b. Microsoft Outlook
- c. Microsoft Excel
- d. Microsoft PowerPoint
- e. Adobe Acrobat
- f. Case management software

5. *E-Filing*

E-filing is mandatory in many jurisdictions,¹³² and courts are discussing making the transition from e-filed paper briefs to electronic briefs that

127. MODEL RULES OF PROF'L CONDUCT r. 1.5(a) (AM. BAR ASS'N 2018); Ivy Grey, *Exploring the Ethical Duty of Technological Competence, Part II*, L. TECH. TODAY (Mar. 9, 2017), <https://www.lawtechnologytoday.org/2017/03/technological-competence-part-ii/>.

128. *Id.*

129. Flaherty, *supra* note 87. Advanced features include cross-references, document comparison, pivot tables, and PDF assembly.

130. Ivy Grey, *How to Meet the Duty of Technology Competence*, L. TECH. TODAY (June 29, 2017), <https://www.lawtechnologytoday.org/2017/06/technology-competence/>; Lambert, *supra* note 7; David Horrigan, *The Luddite Lawyer 2020: AALS Panel Examines Attorney Technology Competence*, LAW.COM: LEGALTECH NEWS (Jan. 8, 2020, 7:00 AM), <https://www.law.com/legaltech-news/2020/01/08/the-luddite-lawyer-2020-aals-panel-examines-attorney-technology-competence/> (last visited Apr. 14, 2020).

131. Procetas, the company founded by Casey Flaherty (*see supra* note 72), produces the Legal Technology Assessment (LTA), which provides training and evaluation on Microsoft Word, Microsoft Excel, and Adobe Acrobat skills. *About Procetas*, *supra* note 72. Procetas makes it easy for law school and firm administrators to implement a training program for those skills.

132. *See, e.g.*, Debra J. Moore, *Mandatory E-filing Has Arrived in the Utah State Courts*, UTAH B.J., Jan.-Feb. 2013, at 16; Matthew Hector, *Courts System Readies for Mandatory E-filing*, 104 ILL. B.J. 14

contain additional functionality.¹³³ The inability to e-file can mean sanctions for attorneys,¹³⁴ and problems with e-filing can mean delays and even losing an appeal.¹³⁵ Law school graduates should be familiar with the functionality of e-filing systems and know how to prepare documents for e-filing. The most commonly used file format for e-filing is Adobe PDF, and law school graduates should be familiar with some of Adobe's advanced features relevant to e-filing. Law school graduates should know the following:

- a. Functionality of e-filing systems
- b. Creating text-searchable PDFs
- c. Electronically signing PDFs
- d. Bookmarking
- e. Combining, adding, deleting, and rearranging pages
- f. Adding Bates numbers¹³⁶

C. Discovery

E-discovery should no longer be considered a specialized, niche skill but a general skill required for legal practice. In our digital world, discovery by default includes e-discovery; even smaller cases include increasing amounts of electronically stored information (ESI). California has gotten in front of this shift by requiring all attorneys involved in litigation to have “at a minimum, a basic understanding of, and facility with, issues relating to e-discovery, including the discovery of electronically stored information.”¹³⁷ While not all law students will become litigators, all lawyers need to know how to preserve and sort through large quantities of electronic files. Beyond the

(2016); Thomas A. Balmer, *Mandatory E-filing: Oregon eCourt Update*, OR. ST. B. BULL., Oct. 2014, at 38.

133. See, e.g., ABA COUNCIL OF APPELLATE LAWYERS, *THE LEAP FROM E-FILING TO E-BRIEFING: RECOMMENDATIONS AND OPTIONS FOR APPELLATE COURTS TO IMPROVE THE FUNCTIONALITY AND READABILITY OF E-BRIEFS* (2017), <https://www.courts.ca.gov/documents/2DCA-the-leap-from-e-filing-to-e-briefing.pdf>.

134. *State ex rel. Okla. Bar Ass'n v. Oliver*, 369 P.3d 1074 (Okla. 2016) (disciplining and publicly censuring an experienced bankruptcy attorney for refusing to learn to e-file).

135. A legal assistant wrongly assumed that the Minnesota e-filing system automatically served a notice of appeal on the county attorney's office, and the appeal was ultimately dismissed for lack of proper service. *E-Filing May Be Easy, But It's Not That Easy*, ROBINS KAPLAN LLP (Apr. 13, 2017), <https://www.robinskaplan.com/resources/publications/2017/04/efiling-may-be-easy-but-its-not-that-easy> (summarizing *In re Welfare of the Children of: A.S. and D.A.S., Sr., Parents*, No. A16-1725 (Minn. Ct. App. Nov. 22, 2016)).

136. Richard Heinrich, *Core Adobe Acrobat Skills for Successful eFiling*, ONE LEGAL (Apr. 8, 2016), <https://www.onelegal.com/blog/core-adobe-acrobat-skills-for-successful-efiling/>.

137. State Bar of Calif. Standing Comm. on Prof'l Resp., Formal Op. No. 2015-193 (2015).

discovery process, these skills are necessary for corporate compliance and general legal practice management.

Very few attorneys can become experts in the technology surrounding e-discovery because of time and skill limitations, but attorneys can develop a basic skill set to manage e-discovery projects competently. The California Bar listed the following skills necessary for e-discovery competence:

- Initially assess e-discovery needs and issues
- Implement ESI preservation procedures
- Analyze the client's ESI systems and storage
- Advise the client on ESI collection and preservation methods
- Identify custodians of potentially relevant ESI
- Develop an e-discovery plan with opposing counsel
- Perform data searches
- Collect responsive ESI in a manner that preserves the ESI's integrity
- Produce responsive, non-privileged ESI in an appropriate manner¹³⁸

The good news is that e-discovery skills build on technology knowledge that attorneys already need for other aspects of practice, such as information storage,¹³⁹ metadata,¹⁴⁰ and legal research.¹⁴¹ Additionally, the law school graduate must be familiar with the following:

1. Common social media platforms (i.e., Instagram, WhatsApp, Twitter, Facebook, TikTok, Snapchat)¹⁴²

138. *Id.* at 3–4.

139. *See* Part III.A, *supra*.

140. *See* Part III.B.3, *supra*.

141. *See* Part III.D, *infra*.

142. “[C]ounsel has a general duty to be aware of social media as a source of potentially useful information in litigation, to be competent to obtain that information directly or through an agent, and to know how to make effective use of that information in litigation.” N.H. Bar Ass’n Op. 2012-13/05 (2013), <https://www.nhbar.org/wp-content/uploads/2020/01/2012-13-05-REFORMATTED-Social-Media-Contact-with-Witnesses-in-the-Course-of-Litigation.pdf>. “If removing postings does not constitute spoliation and is not otherwise illegal, or the removal is done in compliance with the rules and law on preservation and spoliation of evidence, the lawyer may instruct the client to remove existing postings on social media. The lawyer may take possession of printed or digital images of the client’s postings made for purposes of preservation.” N.C. State Bar Ass’n Op. 5 (Jul. 17, 2015), <https://www.ncbar.gov/for-lawyers/ethics/adopted-opinions/2014-formal-ethics-opinion-5/>. *See also* N.Y. State Bar Ass’n, Ethics Op. 745 (2013); Fla. Stat Bar Comm. on Prof’l Ethics, Op. 14-1 (2015), <https://www.florida-bar.org/etopinions/etopinion-14-1/>.

2. E-discovery software functionality (at least one platform)
3. Advanced search techniques

D. Research and Analysis

Research and analysis in the legal field has been transformed by the processing power of computers. Computers provide great benefits to legal research and analysis. They help us locate judicial opinions using keywords without relying on individual memory or a print digest. Computers enable us to update the currency of case law in seconds without needing to decipher obscure symbols in multiple volumes of Shepard's Citation Service. Because of computers, we have rapid access to many more judicial opinions than when we were limited to bound reporters, not to mention access to briefs, corporate filings, and contracts.

But computing power comes with a dark side. We are overburdened with search results that return 10,000 cases, far too many to read, but still the feeling that if we look at just a few more results we will find the "perfect case." Computer usage can lead us to focus on narrow snippets of information, impeding creative problem-solving and big-picture thinking.¹⁴³ Algorithms lull us into believing our searches will always give us the most relevant results,¹⁴⁴ and have automated decision-making regarding copyright violations in a way that has gutted fair use.¹⁴⁵ Algorithms are even invading judges' decision-making.¹⁴⁶

Instead of feeling overwhelmed by the data deluge, law students need some basic technology understanding so *they* can control the tools and the data—not the other way around. Law schools should cover the basics of these related technologies: (1) Algorithms and (2) Artificial Intelligence and Machine Learning. An understanding of algorithms provides a foundation for understanding artificial intelligence and machine learning.

1. Algorithms

Algorithms can be simple or complex, and they are being put to use in an increasing variety of ways in the legal system. The word algorithm means

143. Bintliff, *supra* note 67, at 348.

144. Susan Nevelow Mart, *Every Algorithm Has a POV*, AALL SPECTRUM, Sept.–Oct. 2017, at 40, 44.

145. Dan L. Burk, *Algorithmic Fair Use*, 86 U. CHI. L. REV. 283, 290 (2019).

146. Simonite, *supra* note 3.

“a step by step procedure for solving a problem or accomplishing some end,”¹⁴⁷ in which variables are given different degrees of weight. Algorithms are designed by humans, for humans,¹⁴⁸ to help humans sift through and make sense of massive amounts of information. Algorithms have been used for years by research databases such as Lexis to improve information retrieval, and by programs such as DissoMaster to calculate guideline child support owed by a parent.¹⁴⁹ Other aspects of our lives have been determined by algorithms for years: credit scores, do-not fly lists, and employment screenings are all examples of algorithms at work.¹⁵⁰ Now, in order to increase court efficiency and harness the insights that can be provided by large datasets, algorithms are being deployed in life-altering situations like criminal sentencing.

Understanding algorithms, how they work, and how to critique an algorithm are now among the most important things we can teach in law school because justice depends on it. The exciting and terrifying potential of algorithms has only recently begun to seep into lawyers’ mainstream consciousness,¹⁵¹ and yet no ethics opinions discuss algorithms.¹⁵² A need for a foundational knowledge of algorithms will only increase in importance over the next decade as algorithms are implemented into more and more decision-making tools.

Algorithms operate much like an algebraic formula. Understanding the general gist of how the formula works, what factors are used, and the different weights given are all subject to human comprehension (after all,

147. *Algorithm*, MERRIAM WEBSTER’S ONLINE DICTIONARY, <https://www.merriam-webster.com/dictionary/algorithm> (accessed June 7, 2019). The word derives not from Greek as one might suspect, but from the name of a ninth-century Persian mathematician whose brilliant work in algebra popularized Arabic numerals in Europe. *Algorism*, OXFORD ENGLISH DICTIONARY (1971).

148. Susan Nevelow Mart, *The Algorithm as a Human Artifact: Implications for Legal [Re]search*, 109 L. LIB. J. 387, 388 (2017).

149. Mary K. Tilton, Note, *An Introduction to California’s Child Support Guidelines*, 3 SAN DIEGO JUST. J. 551, 556 fn. 31 (1995) (“Since the introduction of the 1992 guideline formula, many practitioners and courts are turning to computer programs to calculate the net income, particularly the tax liability, and the child support based on that income.”)

150. Deven R. Desai & Joshua A. Kroll, *Trust But Verify: A Guide to Algorithms and the Law*, 31 HARV. J. L. & TECH. 1, 2 (2018).

151. “For lawyers, 2018 was the year of the algorithm—the year that sophisticated computer intelligence emerged both as a legitimate aid to legal decision-making and as a potential source of discrimination, bias, and error.” Tad Simons, *8 Things a Good Lawyer Does that a Computer Algorithm Can’t*, THOMSON REUTERS: LEGAL EXECUTIVE INST. (February 19, 2019), <http://www.legalexecutiveinstitute.com/lawyers-can-do-algorithm-cannot/>.

152. A search for “algorithm” in the Westlaw database “Legal & Judicial Ethics & Disciplinary Opinions” yielded three results, two of which referred to algorithms in reference to encryption, the other of which was in the context of LinkedIn and attorney advertising. See also Baker, *supra* note 7, at 558.

algorithms are designed by humans),¹⁵³ but these elements are held back behind a shroud of mystery and often protected as trade secrets. This obfuscation works exactly like the Wizard of Oz, making algorithms seem more “great and powerful” than they actually are and leading people to place more faith in the responses that algorithms generate than they may deserve—a phenomenon known as automation bias.¹⁵⁴ Ironically, people assume that algorithms do not have the same biases as people do, despite being designed and built by people.

Recent important research by Susan Nevelow Mart on legal research algorithms highlighted the surprising variability in results produced by six different algorithms all designed to perform the exact same function: yield the most relevant cases in response to a research query.¹⁵⁵ The results were particularly surprising because all of the algorithms used the same corpus of case law, and yet “only about seven percent of the cases were returned in search results in all six databases.”¹⁵⁶ Furthermore, each algorithm generated an average of 40 percent unique cases—a significant variation.¹⁵⁷ The oldest research platforms, Westlaw and Lexis Advance, led the pack in highest percentage of relevant cases within the top ten results.¹⁵⁸ These results show how subtly different approaches to the same problem can greatly affect algorithmic results, even within a field in which lawyers might expect a high level of agreement—i.e., determining relevant results in a case law search.¹⁵⁹ Mart’s findings have important implications for teaching legal research to law students,¹⁶⁰ especially as lawyers rely on them more and more to manage

153. Mart, *supra* note 148, at 388 (quoting Mike Dahn, Senior Vice-President of Product Development at Thomson Reuters Legal: “[A]ll of our algorithms are created by humans.”).

154. Baker, *supra* note 7, at 570 (“[T]he problem is how competent it all looks, enticing lawyers to blindly rely on the results.”).

155. Mart, *supra* note 148, at 390. Mart tested research algorithms on the platforms of Google Scholar, Ravel, Westlaw, Lexis Advance, Casetext, and Fastcase. *Id.*

156. *Id.*

157. *Id.* at 415.

158. *Id.* at 414. Westlaw led with 67% relevant cases in the top ten results, followed by Lexis Advance with 57%, Fastcase with 44.7%, Google Scholar with 44.6%, Ravel with 40.5%, and Casetext with 39.7%. *Id.*

159. “The results are a remarkable testament to the variability of human problem solving.” *Id.*

160. “Legal research professors hope to teach their students to achieve the metacognitive skills required to be self-reliant. Black-boxing the research process is not helping educators or students achieve this goal.” *Id.* at 420. See also Mart, *supra* note 144; Susan Nevelow Mart, Joe Breda, Ed Walters, Tito Sierra & Khalid Al-Kofahi, *Inside the Black Box of Search Algorithms*, AALL SPECTRUM, Nov.–Dec. 2018, at 10; Richard A. Danner, *Contemporary and Future Directions in American Legal Research: Responding to the Threat of the Available*, 31 INT’L J. LEGAL INFO. 179, 195 (2003) (“[I]t seems clear that effective legal researchers will continue to need to understand how the search tools they use actually

researching through an ever-growing corpus of case law.¹⁶¹ Mart's findings also hint at problems that will arise as the justice system turns to algorithms to cope with high caseloads and to produce fairer, more consistent outcomes.

The current poster child for the pitfalls of implementing algorithms in the justice system is *State v. Loomis*.¹⁶² The State of Wisconsin purchased a commercial risk assessment tool called COMPAS (Correctional Offender Management Profiling for Alternative Sanctions) that assesses a criminal offender's risk of recidivism. The tool was initially used by the probation department but also came to be used in sentencing as well. The defendant Eric Loomis argued that using COMPAS to sentence him violated his right to due process because COMPAS's proprietary algorithm could not be assessed.¹⁶³ The court found that Loomis' rights were not violated because the risk assessment score was used as only one factor among many¹⁶⁴ and the COMPAS algorithm was transparent enough to warrant the court's reliance on it. The latter finding is troubling because the court relied on the superficial and vague explanations of the company that developed and sells COMPAS, and the fact that Loomis could review the questions that COMPAS asks to use as input for the algorithm, as sufficient explanation of how the algorithm works. But knowing the list of inputs in an algorithm is not enough—just because I know the search terms I entered into Westlaw does not mean I know how Westlaw is using my terms to generate results.¹⁶⁵ Critically, the lawyers arguing the case did not have a sufficient background in algorithms to enable them to make competent arguments. In a concurrence, Justice Shirley Abrahamson stated that the attorneys who argued the case were not able to present sufficient information for the court to evaluate COMPAS.¹⁶⁶

Despite a lack of guidance from bar associations, the duty of competence, which requires attorneys to possess sufficient legal knowledge and

work. This was true when the tools were primarily printed digests and indexes, and it remained true when legal researchers were first introduced to database searching by Lexis and Westlaw.”)

161. See Mary Whisner, *Comparing Case Law Retrievals, Mid-1990s and Today*, U. Wash. Sch. L. Research Paper Forthcoming (Nov. 19, 2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2872394.

162. 881 N.W.2d 749 (Wis. 2016).

163. *Id.* at 757. The defendant made two additional arguments about COMPAS that I do not consider here.

164. *Id.* at 770–771.

165. Mart, *supra* note 148, at 416, 420.

166. 881 N.W. 2d at 774. (“[T]his court’s lack of understanding of COMPAS was a significant problem in the instant case. At oral argument, the court repeatedly questioned both the State’s and defendant’s counsel about how COMPAS works. Few answers were available.”) See also Anne L. Washington, *How to Argue With An Algorithm: Lessons From the COMPAS-Pro Publica Debate*, 17 COLO. TECH. L. J. 131 (2019).

skill, requires understanding algorithms. Jamie J. Baker makes a compelling argument that knowledge of algorithms is also implicated by lawyers' obligation "to act as information fiduciaries for their clients."¹⁶⁷ Baker asserts that "competent lawyers must understand the information they rely on and provide advice to a client that is the result of the lawyer's independent, educated judgement."¹⁶⁸ Ed Walters posits that Rule 5.1 (Duty of Supervision) similarly requires attorneys to understand the technology they use; supervision of software (or an algorithm being run by software) substitutes for the supervision of human employees.¹⁶⁹ The ABA Model Rules 3.3 (Candor Toward the Tribunal) and 4.1 (Truthfulness in Statements to Others) also require attorneys to understand algorithms—honesty requires that attorneys must understand the information they are relying on or rebutting.

In the interests of justice, all law school graduates must understand:

- a. What an algorithm is
- b. The impact of data quality on an algorithm
- c. How experts analyze algorithms
- d. Critiquing an algorithm
- e. Values choices and biases in algorithms

2. *Artificial Intelligence and Machine Learning*

Artificial Intelligence (AI) is a difficult concept to define; the original definition coined in 1955 by John McCarthy is the ability of machines to "behave as though they were intelligent."¹⁷⁰ The goal of AI is to solve problems that have traditionally been solved by humans.¹⁷¹ The difficulty in defining AI lies in drawing a line between computer number-crunching power—which, while difficult for humans, is relatively easy for computers but requires no true "intelligence"—and artificially intelligent behavior that mimics human reasoning, such as decision-making capacity. Indeed, while

167. Baker, *supra* note 7, at 574.

168. *Id.* (citing Jack M. Balkin, *Information Fiduciaries and the First Amendment*, 49 U.C. DAVIS L. REV. 1183, 1208 (2016) (arguing that the duty to act as an information fiduciary is premised on the duties of loyalty and care)).

169. "When a law firm uses software instead of people in part (or in all) of the legal service delivery, the firm would presumably have the same professional responsibility to ensure that the software comports with the rules..." Ed Walters, *The Model Rules of Autonomous Conduct: Ethical Responsibilities of Lawyers and Artificial Intelligence*, 35 GEOR. ST. L. REV. 1073, 1086 (2019).

170. WOLFGANG ERTEL, INTRODUCTION TO ARTIFICIAL INTELLIGENCE I (2017).

171. *Id.* at 2.

useful implementations of AI abound,¹⁷² almost none of them today can be classified as true “artificial intelligence.”¹⁷³

Despite the lack of “intelligent” AI, so-called AI technologies are becoming more powerful and more present in legal practice every year. “Where once lawyers may have only used AI for electronic discovery (e-discovery), today they are using AI for legal research, drafting, contract management, and litigation strategy.”¹⁷⁴ These technologies generally rely on machine learning, a subset of AI that is built upon a foundation of algorithms.¹⁷⁵ In machine learning, computers can change the algorithm over time without the aid of a programmer as the machine “learns” by processing data, discovering patterns and connections.¹⁷⁶ Machine learning is powerful because it can uncover insights in large amounts of unstructured data much more quickly than humans can.

Understanding the basics of AI is important for attorneys for the same reasons as understanding algorithms. The same warnings for algorithms discussed above apply to AI and machine learning. AI results are only as good as the algorithms and the data used to achieve them. AI requires attorney supervision.¹⁷⁷ Furthermore, attorneys need to be able to sort through the hype to select and pay reasonable prices for machine learning tools as they hit the consumer market. Finally, the quality of attorney work will depend increasingly on quality analytical tools; attorneys who do not use available AI tools for research, litigation analysis, and so on will produce work of lesser quality that will eventually reach the level of malpractice.¹⁷⁸ It is highly unlikely law students can learn enough during law school to provide

172. See, e.g., Valeri Craigle, *Law Libraries Embracing AI*, in *LAW LIBRARIANSHIP IN THE AGE OF AI* 59 (Elyssa Kroski ed., 2019).

173. “While access to vast amounts of processing power and data have enabled applications of some basic AI techniques to perform specific tasks, a more general form of AI, capable of thinking for itself beyond those specific tasks, still eludes us. Our computerized world is thus plagued with an artificial stupidity confined to carrying out particular, narrow tasks, and not often very well.” Clark D. Asay, *Artificial Stupidity*, 61 *WM. & MARY L. REV.* (forthcoming 2020) 1187, 1193, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3399170.

174. Walters, *supra* note 169, at 1073.

175. Alexandre Gonfalonieri, *What is an AI Algorithm?*, *MEDIUM* (Apr. 21, 2019), <https://medium.com/predict/what-is-an-ai-algorithm-aceeab80e7e3>.

176. *Id.*

177. “[M]odels estimated by machine learning often have difficult processing contingencies that significantly differ from the data on which the models were trained, and thus, applications of machine learning on overly-broad tasks can result in inaccuracies. Thus, attorneys must avoid overreliance on AI and ensure that they provide effective review and oversight.... Failure to do so can result in errors, missed opportunities and possibly even in ethical violations...” Ben Allgrove & Yoon Chae, *Considerations for Attorneys Using Artificial Intelligence*, *LAW360* (Feb. 14, 2018, 12:27 PM), <https://www.law360.com/articles/1009857/considerations-for-attorneys-using-artificial-intelligence>.

178. Craigle, *supra* note 172, at 60.

in-depth supervision of algorithms and machine learning without having had additional undergraduate or graduate training. Nevertheless, law students can be prepared to work alongside AI professionals to grapple with these issues. Law graduates need to know:

- What AI is and what it isn't
- Examples of AI implementation in the legal field
- What machine learning is
- Examples of machine learning in the legal field
- Pros and cons of implementing AI and machine learning processes

E. Marketing

Technology knowledge related to marketing issues is less extensive, and less critical, for attorneys than other types of technology knowledge discussed in this section. Nevertheless, client development was a major area of concern for the ABA Commission on Ethics 20/20, in addition to confidentiality.¹⁷⁹ The Commission was concerned that the rules regarding the establishment of the attorney-client relationship through online communications, as well as the use of pay-per-click and pay-per-lead-services,¹⁸⁰ were confusing.¹⁸¹

Despite changes made to Model Rule 7.2 (Advertising)¹⁸² and Model Rule 7.3 (formerly Direct Contact with Prospective Clients, now Solicitation of Clients)¹⁸³ to clarify rules regarding Internet advertising, confusion about

179. REPORT OF THE ABA COMMISSION ON ETHICS 20/20, *supra* note 33, at 7, 9.

180. In a “pay-per-click” advertising model, the lawyer or law firm pays the advertiser when a potential client clicks on an ad. Michael Downey, *Legal Ethics, Referral Fees and Internet Advertising*, L. PRAC., Mar.–Apr. 2017, at 18. In a “pay-per-click” model, the lawyer or law firm pays the advertiser when a potential client submits her information through an online form. *Id.*

181. REPORT OF THE ABA COMMISSION ON ETHICS 20/20, *supra* note 33, at 10.

182. In addition to including “Internet-based advertisements” among the list of advertising formats permitted, the following language was added to Comment 5 of Rule 7.2: “Moreover, a lawyer may pay others for generating client leads, *such as Internet-based client leads*, as long as the lead generator . . . is consistent with Rules 1.5(e) (division of fees) and 5.4 (professional independence of the lawyer), and the lead generator’s communications are consistent with Rule 7.1 (communications concerning a lawyer’s services).” MODEL RULES OF PROF’L CONDUCT r. 7.2 cmt. 5 (AM. BAR ASS’N 2018) (emphasis added).

183. A new Comment 1 was added to Rule 7.3 defining “solicitation”: “A solicitation is a targeted communication initiated by the lawyer that is directed to a specific person and that offers to provide, or can reasonably be understood as offering to provide, legal services. In contrast, a lawyer’s communication typically does not constitute a solicitation if it is directed to the general public, such as through a billboard, an Internet banner advertisement, a website or television commercial, or if it is in response to a request

the ethics of using Internet-based advertising models lingers.¹⁸⁴ The Commission intended the changes to permit attorney use of pay-per-click advertisements and pay-per-lead services on the Internet.¹⁸⁵ However, prohibitions against paying for personal endorsements and other rules have caused state bar associations to issue differing opinions on Internet advertising.¹⁸⁶ Differences in opinion and changing technology makes it imperative that attorneys pay attention to the applicable ethics rules and understand the underlying technology to make sound decisions.¹⁸⁷

In order to advertise effectively and ethically, attorneys should be familiar with how Internet advertising works, such as the various types of Google Ad campaigns (e.g., the Search Network Campaign and the Display Network Campaign).¹⁸⁸ With the recent scandals involving Facebook's data sharing with companies such as Apple, Netflix, and Cambridge Analytica,¹⁸⁹ lawyers should also understand advertising services' data collection policies to safeguard themselves and their clients and potential clients.¹⁹⁰ Law graduates should understand:

1. Internet advertising models
2. Pay-per-click advertising
3. Pay-per-lead advertising
4. Search engine optimization (SEO)
5. Data collection related to advertising

for information or is automatically generated in response to Internet searches." MODEL RULES OF PROF'L CONDUCT r. 7.3 cmt. 1 (AM. BAR ASS'N 2018).

184. See, e.g., Gary Blankenship, *Opinion Will Address LRS Fees: Key Issues About Lawyer Referral Services, Online Companies That Seek to Match Potential Clients With Lawyers, and Bar Regulation Will Be Addressed*, FLA. B. NEWS, Aug. 15, 2017, at 1.

185. REPORT OF THE ABA COMMISSION ON ETHICS 20/20, *supra* note 33, at 7, 9.

186. See, e.g., 'Pay-Per-Lead' Plan on Its Way to the Bar Board of Governors, FLA. B. NEWS, Mar. 15, 2017, at 13.

187. Downey, *supra* note 180.

188. *About Google Ads Campaign Types*, GOOGLE ADS HELP, <https://support.google.com/google-ads/answer/2567043?co=ADWORDS.IsAWNCustomer%3Dtrue&hl=en> (last visited Apr. 21, 2020). Search Network campaigns show ads to people who are actively seeking out information; an ad is triggered based on the keywords a user enters into Google. *About Search Network Campaigns in the New Google Ads Experience*, GOOGLE ADS HELP, <https://support.google.com/google-ads/answer/7190096> (last visited May 14, 2020). Such advertisements are now clearly permissible under the revised Comment 1 to Model Rule 7.3.

189. Gabriel J.X. Dance, Michael LaForgia & Nicholas Confessore, *As Facebook Raised a Privacy Wall, It Carved an Opening for Tech Giants*, N.Y. TIMES, Dec. 18, 2018, at A1, <https://www.nytimes.com/2018/12/18/technology/facebook-privacy.html?action=click&module=RelatedCoverage&pgtype=Article®ion=Footer>.

190. Many of the companies involved in the Facebook data collection scandal stated they "were unaware of the broad powers Facebook had granted them." *Id.*

F. Technology Resilience: Assessing the Benefits and Risks of Technology... and Beyond

The most impactful portion of the Commission's report and the resulting rule changes was the inclusion in the Model Rules of Comment 8 to Rule 1.1 requiring "a lawyer [to] keep abreast of changes in the law and its practice, including the benefits and risks associated with relevant technology"¹⁹¹ Information is the attorney's raw material, and technology is an essential tool for working with information.¹⁹² Assessing and deploying technology thoughtfully and purposefully are among the most critical skills attorneys can possess.

The language of Comment 8 can be unpacked into three separate skills: 1) the ability to use technology appropriately and efficiently; 2) the ability to assess technology and whether it should be applied in a given situation; and 3) the ability to adapt to new technology. These three skills combined constitute what I call "technology resilience." Technology resilience is the ability to use existing technology successfully and to approach new technology thoughtfully and with an open mind.

The first skill, using technology appropriately and efficiently, is best taught by incorporating technology training and skills practice throughout the law school curriculum in small but impactful ways. Using skills repeatedly and within the context of different assignments improves learning.¹⁹³ For example, law students in their first year should learn advanced features of Microsoft Word, such as creating an automatic table of contents. Students can then reuse those skills—and faculty should demand that they do—throughout their time in law school.¹⁹⁴

Increasing awareness of technologies used in current practice ought to be part of this training. As Gabe Teninbaum remarked, "Students need to understand what technologies are relevant and how to identify the tools that

191. REPORT OF THE ABA COMMISSION ON ETHICS 20/20, *supra* note 33, at 8; MODEL RULES OF PROF'L CONDUCT at r. 1.1 cmt. 8 (AM. BAR ASS'N 2018).

192. "Lawyering is, arguably, more information intensive than any other industry or profession." RICHARD SUSSKIND, *THE FUTURE OF LAW* 79 (1996).

193. Gene Koo, *New Skills, New Learning: Legal Education and the Promise of New Technology* 13 (Berkman Ctr. for Internet & Soc'y, Harv. L. Sch., Research Pub. No. 2007-4, 2007), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=976646; Kristin B. Gerdy, *Teacher, Coach, Cheerleader, and Judge: Promoting Learning Through Learner-Centered Assessment*, 94 *LAW LIBR. J.* 59, 65 (2002); Paul S. Ferber, *Adult Learning Theory and Simulations—Designing Simulations to Educate Lawyers*, 9 *CLINICAL L. REV.* 417, 433 (2002).

194. Part of the challenge is that many faculty do not possess the technology skills discussed in this article. This situation will improve as law schools begin training the faculty of the future with technology skills.

might help them in any given situation. Not every student needs to learn how to code, build an expert system, or automate documents, but every one of them should be able to recognize where those technologies will be useful...¹⁹⁵ Students should have some experience in selecting tools to solve a problem.

A basic understanding of technologies such as cybersecurity, information storage, algorithms, and office productivity tools provides a foundation for the second skill, technology assessment. The legal community should develop a technology assessment framework for attorneys that law students can practice using in law school. The framework could be something like the Emerging Technology Analysis Canvas (ETAC),¹⁹⁶ which is loosely based on the Business Model Canvas,¹⁹⁷ or the factors identified by the Forbes Technology Council.¹⁹⁸ The ETAC model and the Forbes Technology Council factors help businesses identify stakeholders, costs, use cases, and goals when considering new technology. A law-focused model should include a consideration of the Model Rules.

Finally, law schools should foster technology adaptability in students. As Byron Reese wrote, “The great skill is to be able to learn new things, and luckily, we all have that. In fact, that is our singular ability as a species.”¹⁹⁹ Adaptability is a difficult skill to teach, but legal educators can cultivate curiosity and help students gain confidence, both of which help develop adaptability. Legal educators can encourage experimentation by providing access to a variety of legal technologies. Educators can make students aware of resources that can help them continue to learn, and openly discuss their own efforts to learn new skills, including both positive and negative experiences.

The burden of teaching technology skills should not fall solely upon law schools. Ideally, law students would matriculate already having a grounding in information storage, cybersecurity, and algorithms. Some universities are making efforts to encourage technology skill development in undergraduate

195. Ari Kaplan, *Reimagining Innovation in Legal Education*, ABOVE THE L. (Jan. 11, 2019, 8:18 AM), <https://abovethelaw.com/career-files/reimagining-innovation-in-legal-education/>.

196. Paul Fremantle, Srinath Perera, Frank Leymann & Joanne Jenkins, *Emerging Technology Analysis Canvas (ETAC)*, GITHUB (May 22, 2019, Version 0.8), <https://github.com/wso2/ETAC/blob/master/ETAC.md>.

197. ALEXANDER OSTERWALDER, *BUSINESS MODEL GENERATION: A HANDBOOK FOR VISIONARIES, GAME CHANGERS, AND CHALLENGERS* (2010).

198. Expert Panel, Forbes Tech. Council, *Nine Ways to Decide If a New Technology Will Work for Your Firm*, FORBES (Jan. 23, 2019, 7:30 AM), <https://www.forbes.com/sites/forbestechcouncil/2019/01/23/nine-ways-to-decide-if-a-new-technology-will-work-for-your-firm/#98547224f596>.

199. Byron Reese, *The Great Myth of the AI Skills Gap*, SINGULARITYHUB (Feb. 13, 2019), <https://singularityhub.com/2019/02/13/ai-wont-create-a-skills-gap-heres-what-will-happen-instead/>.

students,²⁰⁰ but participation is generally voluntary and often does not include the kinds of skills needed in law. Law school administrators situated within larger universities should identify and approach allies within the university community who value similar technology skills, and join forces to advocate for skills training to be included in general education requirements. It is a monumental task, but one that will pay great dividends. Not only will technology skills courses help students be better prepared for careers and post-graduate training, students will very likely respond positively to those programs with higher enrollments.²⁰¹ Prominent flagship universities are well-placed to set a trend that could cause other institutions to follow suit. Legal educators should also look for opportunities to encourage appropriate technology education in secondary schools.²⁰²

Law graduates need to have:

1. Confidence in their abilities to use technology efficiently and appropriately
2. Exposure to various technologies used in legal practice
3. Familiarity using a model to assess new technology
4. Willingness to try new technology
5. Comfort with the discomfort of learning new technology
6. Technology skills and experience prior to law school

200. Becky Supiano, *How One College Helps All Students Gain Digital Skills*, CHRON. HIGHER EDUC. (Oct. 13, 2019), <https://www.chronicle.com/article/How-One-College-Helps-All/247305>; John Villasenor, *Preparing Today's Students for an AI Future*, CHRON. HIGHER EDUC. (Oct. 13, 2019), <https://www.chronicle.com/article/Preparing-Today-s-Students/247310>.

201. A recent study found that "students in [the] focus groups often became energized when discussing the impact of algorithms on equality, status, inclusion, and opportunities." ALISON J. HEAD, BARBARA FISTER & MARGY MACMILLAN, INFORMATION LITERACY IN THE AGE OF ALGORITHMS 34 (Project Info. Literacy, Jan. 15, 2020), https://www.projectinfolit.org/uploads/2/7/5/4/27541717/algoreport_1.pdf. M.B.A. programs have added STEM emphases, especially data analysis, to attract more students. Patrick Thomas, *Schools Rush to Add Science to M.B.A.s*, WALL STREET J., Feb. 6, 2020, at B5. Furthermore, studies have shown that students have a high desire for more technology in the classroom, suggesting that students would respond positively to technology skills training. Richard W. Walker, *College Students Want More Technology*, ECAR Survey Says, EDSCOOP (Oct. 24, 2017), <https://edscoop.com/college-students-want-more-technology-ecar-survey-says/>.

202. There has been some discussion about the value of technology skills training in elementary, secondary, and even preschool education. See, e.g., Robert Sedgewick & Larry Cuban, *Should All Children Learn to Code by the End of High School?*, WALL STREET J., Feb. 24, 2020, at R1. Much of that discussion focuses on how technology training develops students' cognitive skills and not the value of the skills *per se*. See, e.g., Serdar Çiftci & Ahmet Bildiren, *The Effect of Coding Courses on the Cognitive Abilities and Problem-Solving Skills of Preschool Children*, 30 COMPUTER SCI. EDUC. 3 (2020).

CONCLUSION

Attorneys will increasingly be required to partner with technology to manage and make sense of the ever-growing tsunami of information that is rolling over us. Attorneys need to be knowledgeable and skillful users of technology, and the Model Rules and ethics opinions provide a framework of those essential skills.

Assisting law students in developing the technology skills and knowledge necessary for 21st century practice does not require an overwhelming commitment of resources. The technology basics needed are just that—basics. Just as graduating law students need not be experts in constitutional law or patent law, they do not need to be experts in cybersecurity or coding. Nevertheless, law school graduates need a foundation they can build upon throughout their careers. Small, thoughtful initiatives and consistent practice will provide great dividends in competent attorneys who can help shape a better, more just legal system in the future.

APPENDIX: OUTLINE OF PROPOSED LEGAL COMPETENCE STANDARDS FOR
LAW GRADUATES

A. Information Storage

1. Cloud Storage
 - a. Security procedures
 - b. Backup procedures
 - c. Awareness of where the data is stored and privacy laws and protections of the hosting jurisdiction
 - d. Vendor assurances of maintaining confidentiality of the data
 - e. Notification of unauthorized access
 - f. Ability to retrieve information
 - g. Past reliability and reputation of the vendor
2. Information Storage and Maintenance
 - a. Data storage locations
 - b. Data backup
 - c. Short-term and long-term storage
 - d. Storage costs and stability
 - e. Data destruction
 - f. Data recovery
 - g. Copying and transferring data
 - h. Preservation of social media and other ephemeral data
 - i. How third-party service providers use data
3. Information Security
 - a. Proper disposal of electronic devices
 - b. Mobile apps privacy
 - c. Cybersecurity
 - d. Securing network infrastructure
 - e. Securing the internet of things (IOT)
 - f. Risk assessment
 - g. Firewalls
 - h. Encryption
 - i. Good security habits
 - j. Protecting USB drives
 - k. Securing wireless networks
 - l. Supplementing passwords (two- and multi-factor authentication)
 - m. Strong passwords
 - n. Bluetooth technology
 - o. Software updates and patches
 - p. Website security
 - q. Securing wireless networks

- r. Client portals
 - s. Protecting against ransomware and malicious code
 - t. Protecting against social engineering and phishing attacks
 - u. Denial-of-service attacks
 - v. Attack response and recovery
 - w. Natural disaster recovery
 - x. Malware
 - y. Identity theft
 - z. Digital signatures
 - aa. Email attachments
- B. Communication
- 1. Email and Other Electronic Communication
 - a. Email encryption
 - b. Digital signatures
 - c. How to explain security and communication protocols to clients
 - 2. Redaction
 - a. Redacting in Adobe Acrobat
 - b. Redacting in e-discovery software
 - c. Improper/insufficient redaction methods
 - 3. Metadata
 - a. Definition of metadata
 - b. Examples of common metadata types
 - c. Location of metadata in commonly used programs
 - d. Metadata removal
 - 4. Office Software
 - a. Microsoft Office
 - b. Microsoft Outlook
 - c. Microsoft Excel
 - d. Microsoft PowerPoint
 - e. Adobe Acrobat
 - f. Case management software
 - 5. E-Filing
 - a. Functionality of e-filing systems
 - b. Creating text-searchable PDFs
 - c. Electronically signing PDFs
 - d. Bookmarking
 - e. Combining, adding, deleting, and rearranging pages
 - f. Adding Bates numbers

- C. Discovery
 1. Common social media platforms (i.e., Instagram, WhatsApp, Twitter, Facebook, TikTok, Snapchat)
 2. E-discovery software functionality (at least one platform)
 3. Advanced search techniques
- D. Research and Analysis
 1. Algorithms
 - a. What an algorithm is
 - b. The impact of data quality on an algorithm
 - c. How experts analyze algorithms
 - d. Critiquing an algorithm
 - e. Values choices and biases in algorithms
 2. Artificial Intelligence and Machine Learning
 - a. What AI is and what it isn't
 - b. Examples of AI implementation in the legal field
 - c. What machine learning is
 - d. Examples of machine learning in the legal field
 - e. Pros and cons of implementing AI and machine learning processes
- E. Marketing
 1. Internet advertising models
 2. Pay-per-click advertising
 3. Pay-per-lead advertising
 4. Search engine optimization (SEO)
 5. Data collection related to advertising
- F. Technology Resilience: Assessing the Benefits and Risks of Technology...and Beyond
 1. Confidence in their abilities to use technology efficiently and appropriately
 2. Exposure to various technologies used in legal practice
 3. Familiarity using a model to assess new technology
 4. Willingness to try new technology
 5. Comfort with the discomfort of learning new technology
 6. Technology skills and experience prior to law school