ARTICLES

Taking on the Ethical Obligation of Technology Competency in the Academy: An Empirical Analysis of Practice-Based Technology Training Today

JESSICA DE PERIO WITTMAN* AND KATHLEEN (KATIE) BROWN**

> *"Life moves pretty fast. If you don't stop and look around once in a while, you could miss it."*[1]

ABSTRACT

Today's lawyers must be technologically competent, per Model Rule of Professional Conduct 1.1. Law schools and law firms were keenly aware of this expectation and summarily responded. While law firms offered more professional development opportunities, law schools began offering various courses focusing on technology skills. These courses have increased and evolved over time as the curriculum has changed with the technology.

First, we present the evolution of ethical requirements surrounding legal technology competency and offer a description of the lawyering competency models most discussed today. We then review data about technology trends at the most innovative law firms and examine curricular offerings in technology or technology-related fields at American Bar Association-accredited law schools. Next, we offer a comparative analysis of multiple empirical studies to determine whether key areas of technology training were reflected in the legal education curriculum and were sufficient to meet ABA ethical expectations. Finally, we recommend solutions law schools may implement to increase technology

* Director of the Law Library, Associate Professor of Law, and Cornelius J. Scanlon Scholar, University of Connecticut School of Law.

** Associate Dean for Information Resources, Charleston School of Law. The authors thank Rebecca Fordon for sharing her study results. We would also like to thank Dean Larry Cunningham and Professor Leslie C. Levin for their feedback. We also thank our student research assistants, Julia Audibert, Joanna Averch, Haley Hinton, Sarah Hollis, Heide Hernandez Jimenez, and Joseph (Dante) Meade.

1. FERRIS BUELLER'S DAY OFF (Paramount Pictures 1986).

instruction, services, and infrastructure to meet ethical standards. ABA-accredited schools should implement these recommendations in light of ABA Standard 301(a), the forecasted changes planned by the National Conference of Bar Examiners, and the new virtual practice landscape set by the COVID-19 pandemic.

TABLE OF CONTENTS

INTRODUCTION

The legal landscape is constantly changing, and the need to implement technology competence has increased.[2] In turn, the legal profession has reformed ethical and professional norms concerning the use of technology. At times, this reform manifests as a disconnect between the guidelines suggested by the American Bar

2. The terms "competence" and "competency" will be used throughout this article. The authors specifically use the term "competence" when discussing Model Rule 1.1 of the *Model Rules of Professional Conduct* ("*Model Rules*"), as this is the specific term used in the rule. The authors define technology competence as an individual's capacity to perform specific technology skills and/or responsibilities. The authors define technology competency as an individual's actual knowledge and performance when handling technology (or technology-related) issues in a particular situation or in relation to legal practice. *See generally* Heidi Frostestad Kuehl, *Technologically Competent: Ethical Practice for 21st Century Lawyering*, 10 CASE W. RSRV. J.L., TECH. & INTERNET 1 (2019).

Association ("ABA") and the actual practice of law regarding the duty of technology competence. Further complicating this issue, the legal profession categorizes and defines legal technology in various ways.[3] Generally, legal professionals define "legal technology" as all devices or systems used to interact with the substance of law, anything that assists users in interacting with the law, and the skills and techniques by which lawyers and legal professionals use these technologies.[4] For example, the recently published Legal Department Operations ("LDO") Index supports the assertion that corporate legal departments have increasingly adopted critical legal technology[5] to decrease cost and increase workflow efficiencies.[6] In the LDO Index, over half of the respondents reported an increase in their use of legal technology in the last year.[7] At the same time, the LDO Index also identified that the top three concerns for corporate legal departments are related to, or could be mitigated by, implementing proper technology.[8] The three concerns are controlling outside counsel costs (87%), using technology to simplify workflow and manual processes (74%), and focusing on internal data security (73%).[9]

Legal associations, such as the ABA, have attempted to resolve this disconnect by offering professional guidance and training on critical legal technology that supports the duty of technology competence.[10] For example, there has been a need for additional professional development opportunities for attorneys in both technology and legal technology.[11] As noted above, correctly understanding and using standard law office technology processes can improve an attorney's efficiency and lower client costs.[12] In 2013, D. Casey Flaherty[13] discussed the Kia

3. *See* Ryan Whalen, *Defining Legal Technology and Its Implications*, 30 INT'L J.L. & INFO. TECH. 47, 48 (2022).

4. *Id.* at 52. For further discussion on the various definitions of "legal technology" and the potential limitations of each definition, see generally *id.*

5. THOMSON REUTERS INST., LEGAL DEPARTMENT OPERATIONS (LDO) INDEX: THE RISK OF BEING LEFT BEHIND 2, 2–3 (6th ed. 2021), https://legal.thomsonreuters.com/content/dam/ewp-m/documents/legal-tracker/en/pdf/reports/2021-ldo-report.pdf [https://perma.cc/35A5-TT5U] ("Critical legal technologies" have been identified as Spend & Matter Management, eSignature, Legal Research, Legal Hold, Document Management, eDiscovery, Contract Management, Legal Business Intelligence/Dashboarding/Analytics, and IP Management.).

6. *Id.* at 2.

7. *Id.*

8. *See id.* at 5; *see also* Lori D. Johnson, *Navigating Technology Competence in Transactional Practice*, 65 VILL. L. REV. 159, 164 (2020) (asserting that lawyers who dedicate time to using technology effectively in practice can improve access to representation, increase their ability to generate more billable work, and expand and enhance their practice).

9. THOMSON REUTERS INST., *supra* note 5, at 5.

10. *See* Mark Rosch, *2020 Technology Training*, ABA TECHREPORT 2020 (Nov. 16, 2020), https://www.americanbar.org/groups/law_practice/publications/techreport/2020/techtraining/ [https://perma.cc/Y4FG-QEMB].

11. The ABA frequently offers new webinars to its members regarding technology and legal technology through its CLE Member Benefit Library. *See Free Member Benefit CLE Library*, AM. BAR ASS'N, https://www.americanbar.org/cle-marketplace/cle-library/ [https://perma.cc/BF7W-YVET] (last visited Sept. 23, 2022).

12. *See* THOMSON REUTERS INST., *supra* note 5, at 2.

13. In 2013, Flaherty served as the General Counsel for Kia Motors. He has since served as the director of legal project management at Baker McKenzie and, as of April 2021, has joined legal tech collective LexFusion.

Technology Audit[14] and drew attention to the woefully inadequate technology skills of many practicing attorneys seeking Kia's business.[15] A 2017 study by Clio[16] also highlighted how inefficient attorneys could be in their day-to-day practice. For example, configuring technology accounted for 11% of an attorney's time, equal to about forty minutes of the attorney's day.[17] Proper technology training would mitigate this inefficient use of time.

Additionally, the 2020 ABA Legal Technology Survey Report indicates that 82% of respondents thought it was "very important" or "somewhat important" to receive training on their firm's technology. Still, the report also reveals a slight decline in the legal technology training offered to attorneys at some law firms.[18] The discrepancies introduced by the data in the LDO Index, the Kia Technology Audit, and the ABA Legal Technology Survey Report highlight why legal professionals should not overlook the ethical and professional norms recommended by the *Model Rules of Professional Conduct* ("*Model Rules*") and required by many state bars.[19]

However, training that supports the ethical duty of technology competence does not have to begin at the law firm. ABA Standard 301(a) states: "[a] law school shall maintain a rigorous program of legal education that prepares its students, upon graduation, for admission to the bar and for effective, ethical, and

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Bob Ambrogi, *Video: Casey Flaherty Discusses His Move from Baker McKenzie to LexFusion*, LAWSITES (Apr. 9, 2021), https://lawsitesblog.com/2021/04/video-casey-flaherty-discusses-his-move-from-baker-mckenzie-to-lexfusion.html [https://perma.cc/E9PL-GS3J].

14. Flaherty, during his role as "corporate counsel at Kia Motors America, created and implemented a technology audit for the firms that worked with Kia." R. Amani Smathers, *The 21st-Century T-Shaped Lawyer*, 40 No. 4 L. PRAC. 32, 35 (2014).

15. In the Kia Technology Audit, Flaherty found that the lawyers lacked basic technology competence, and the resulting inefficiencies led to unnecessary costs for the company. Firms were expected to slash their fees until they could pass the audit. Flaherty is now working with Suffolk University Law School to expand the audit to make the information available to the broader legal marketplace. *Id*. at 35; *see* Kuehl, *supra* note 2, at 5 (first citing D. Casey Flaherty, *The New Normal: Could You Pass This In-House Counsel's Tech Test? If the Answer Is No, You May Be Losing Business*, LEGAL REBELS (July 17, 2013), https://www.abajournal.com/legalrebels/article/could_you_pass_this_in-house_counsels_tech_test [https://perma.cc/64AP-P6V8]; and then citing D. Casey Flaherty, *Taming Technology*, 32 No. 1 ACC DOCKET 96, 96 (2014)).

16. Clio offers law firms cloud-based software that handles various law practice management tasks including client intake, contact management, calendaring, document management, timekeeping, billing, and trust accounting. *Clio. The Law Firm Lifesaver. Legal Software with 70+ Bar Approvals*., CLIO, https://www.clio.com [https://perma.cc/SE78-73AM] (last visited Sept. 23, 2022).

17. A 2017 Clio Legal Trends Report on lawyer efficiency found that the average lawyer working eight hours a day produced only 2.3 hours of billable legal work and the remaining six hours were spent on administrative tasks such as "office administration, generating and sending bills, configuring technology, and collections." CLIO, LEGAL TRENDS REPORT 11, 13 (2017); Johnson, *supra* note 8, at 163–64.

18. *See* Rosch, *supra* note 10 (It presented results of the 2020 ABA Legal Technology Survey Report, where 59% of respondents said technology training was available in their firm. In 2019, the percentage was 60%. The largest gap exists in solo and small firms, with 27% of solos and 50% of small firm attorneys reporting access to technology training.).

19. *See* Smathers, *supra* note 14, at 37. *See generally* Johnson, *supra* note 8, at 165–78 (discussing that state bar associations require the duty of technology competence through the adoption of the exact, or slightly modified, ABA language in Model Rules 1.1 and 1.6, or legal technology ethics opinions).

responsible participation as members of the legal profession."[20] In response to the new ABA Standards and the training discrepancy offered at law firms, law schools began offering basic technology training in required first-year legal practice courses and upper-level legal technology courses.[21] Basic technology training is necessary, but unfortunately, it is simply not enough.[22] Law schools have an ethical obligation to offer technology competence as part of a student's professional identity.[23] Technology training is an ethical requirement, and law schools should integrate these professional skills into the curriculum.[24] Currently, law schools address technology competence in "Advanced Legal Research," "Law Practice & Technology" (or similarly-named classes), and "Legal Practice" (or legal research and writing classes taught in the first-year curriculum).[25] However, the curriculum for each course will differ depending on the law school's overall commitment to technology instruction[26] and whether the state has adopted the ethical duty of technology competence to any degree.[27] This inconsistent value placed on of legal technology leaves a few students with deep knowledge of specific technology skills and many students with, at best, a cursory understanding of technology.[28]

This Article builds on the many works that have documented the evolution of ethical requirements surrounding legal technology competency. First, the Article describes the lawyering competency models most prevalently discussed in legal practice today. Then, it addresses the curricular changes in legal education that

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20. STANDARDS AND RULES OF PROCEDURES FOR APPROVAL OF LAW SCHOOLS, Program of Legal Education, Standard 301(a) (Am. Bar Ass'n 2022–23) [hereinafter ABA STANDARDS].

21. *See infra* Part I; *see also* Iantha M. Haight, *Digital Natives, Techno-Transplants: Framing Minimum Technology Standards for Law School Graduates*, 44 J. LEGAL PROF. 175, 188–92 (2020); Dyane L. O'Leary, *"Smart" Lawyering: Integrating Technology Competence into the Legal Practice Curriculum*, 19 U.N.H. L. REV. 197, 199, 201 (2021).

22. *See* Haight, *supra* note 21, at 194–95 (discussing the "mythical" digital native going to law school). *See generally* O'Leary, *supra* note 21.

23. *See* ABA STANDARDS, *supra* note 20, at Standard 303(b)(3) (commenting that law schools will be required to provide substantial opportunities to students for "the development of a professional identity").

24. *See id.* at Interpretation 303–05 ("Professional identity focuses on what it means to be a lawyer and the special obligations lawyers have to their clients and society. The development of professional identity should involve an intentional exploration of the values, guiding principles, and well-being practices considered foundational to successful legal practice."); O'Leary, *supra* note 21, at 200; *see also* Kristen E. Murray, *Take Note: Teaching Law Students to be Responsible Stewards of Technology*, 70 CATH. U. L. REV. 201, 226 (2021) ("At a minimum, law schools should be encouraging students to determine their own best practices for integrating technology into their professional lives.").

25. For example, Dyane L. O'Leary offers a course called Legal Practice Skills that offers a component of legal technology. In her 2021 article, O'Leary encourages other Legal Practice professors to introduce technology into their curriculum. *See* O'Leary, *supra* note 21, at 201–22.

26. *See infra* Part III.

27. The *Model Rules* as set forward by the ABA are adopted individually by each state. Typically, the state bar association petitions the state supreme court with recommendations as to which rules to adopt or amend. The state supreme court then adopts the rule by releasing its opinion. *See infra* Part I.

28. For example, O'Leary offers a "how-to" guide centered on five broad categories of technology competence: (1) Legal Document Proficiency; (2) Legal Analytics & Document Integration/Brief Analysis; (3) E-Discovery; (4) Law Practice Technology; and (5) Data Security. O'Leary, *supra* note 21, at 201–02.

align with the expectations for legal technology competence set by the ABA and the legal profession. We approach these topics with an empirical lens by reviewing data about technology trends at the most innovative law firms and examining curricular offerings in technology or technology-related fields at ABA-accredited law schools.[29] Next, we introduce results from our longitudinal study on legal technology courses offered in ABA-accredited law schools from 2017 to 2021. We collected the data from the survey questions included in Appendices A and B. Moreover, the Article provides a comparative analysis between this data and other publicly available empirical studies to determine whether key areas of technology training were reflected in the legal education curriculum and were sufficient to meet the ethical expectations set by the ABA. Finally, this Article encourages law schools to increase technology instruction to meet ABA ethical standards, the new virtual practice landscape set by the COVID-19 pandemic, and the potential changes posed by the National Conference of Bar Examiners ("NCBE") for a skills-based bar examination.[30]

I. TODAY'S LAWYERS AND THE DUTY OF TECHNOLOGY COMPETENCE

The ABA recommends ethical norms that a modern-day attorney should follow to practice law in the United States.[31] These ethical norms have governed the practice of law for over a century and cover various topics directly related to the practice of law.[32] Once a state adopts these rules, all attorneys certified to practice in that state must comply.[33] In this Part, we discuss the historical development of competence in the profession and how it evolved into the duty of competence all attorneys must adhere to today.

A. HISTORICAL DEVELOPMENT OF COMPETENCE IN THE PROFESSION

In 1906, the ABA decided it was necessary to address individuals in the profession who had demonstrated "graft," "greed," "gain," and "other unworthy

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29. Technology competency impacts attorneys in settings outside of big law firms (e.g., in-house, government, nonprofit). Building upon the earlier work done by Daniel W. Linna Jr. and Jordan Galvin, we selected a subset of law firms that were included in the Law Firm Innovation Index. Daniel W. Linna, *Legal Services Innovation Index*, LEGALTECHINNOVATION.COM, https://www.legaltechinnovation.com/ [https://perma.cc/PU6E-YP77] (last visited Sept. 23, 2022).

30. *National Conference of Bar Examiners Program – Building the Next Generation of the Bar Exam*, ASS'N OF AM. L. SCHS. (Jan. 6, 2022, 3:10 PM), https://memberaccess.aals.org/eweb/DynamicPage.aspx?webcode=SesDetails&ses_key=406ddc06-7408-477c-9cf9-8f914a109bb1 [https://perma.cc/6FX3-KRUY]; *Next Generation of the Bar Exam*, NAT'L CONF. OF BAR EXAM'RS, https://www.ncbex.org/about/nextgen-bar-exam/ [https://perma.cc/V8SK-WUNB] (last visited Sept. 23, 2022).

31. *See generally* MODEL RULES OF PROF'L CONDUCT (2018) [hereinafter MODEL RULES].

32. *See* Haight, *supra* note 21, at 180.

33. *See* Robert Ambrogi, *Tech Competence*, LAWSITES, https://www.lawsitesblog.com/tech-competence [https://perma.cc/T5VX-D6R8] (last visited Sept. 23, 2022). *See generally* Kuehl, *supra* note 2; Johnson, *supra* note 8; Haight, *supra* note 21; Jamie J. Baker, *Beyond the Information Age: The Duty of Technology Competence in the Algorithmic Society*, 69 S.C. L. REV. 557 (2018).

motive[s].”[34] In response, the ABA published the *Canons of Professional Ethics* in 1908 (“*1908 Canons*”).[35] The *1908 Canons* would serve as the ABA’s first round of ethical guidelines for the legal profession that focused on the moral reputation of attorneys.[36] The final report from the ABA Committee on the Code of Professional Ethics of 1908 divulged the intended goals behind the publication of the *Canons*,[37] namely to serve “as a guide to the youthful practitioner” and as a teaching tool for practicing attorneys in all stages of their career.[38] The *1908 Canons* brought public attention to the ethical expectations lawyers had for themselves and addressed the misconduct of a few who tainted the profession.[39]

The original *Canons* did not include the duty of competence. It appeared for the first time in the 1969 revised version.[40] Aptly renamed the *Model Code of Professional Responsibility* (“*Model Code*”), this new ethics document hoped to make competence compulsory.[41] The applicable section stated, “A Lawyer Should Represent a Client Competently,” but the competence assessment was left to the individual attorney to determine on a situation-by-situation basis.[42] The 1969 *Model Code* did not formally define competence, and the 1979 annotated version specifically stated that “[t]he Code contains no definition of Competence or guidelines for measuring that quality.”[43] In 1983, the ABA adopted a new version of the rules, the *Model Rules*. This version highlighted the duty of competence at the beginning as Model Rule 1.1 (Duty of Competence).[44] Additionally,

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34. Haight, *supra* note 21, at 180 (quoting ABA Comm. on Code of Prof’l Ethics, *Report of the Committee of Professional Ethics*, 29 ANN. REP. AM. BAR ASS’N 600, 601 (1906)).

35. *Id.*

36. *Id.*

37. *Id.* at 181–82.

38. *Id.* at 182, 182 n.21 (quoting John F. Sutton, Jr., *Guidelines to Professional Responsibility,* 39 TEX. L. REV. 391, 405 (1961) (“The American Bar Association canons were designed to serve as general educational guides to proper professional conduct.”)).

39. The purpose of the *Canons* was to address “‘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 unworthy men who steal into its ranks, yet who in no way represent its spirit or morale.’” *Id.* at 181–82 (emphasis omitted) (quoting ABA Comm. on Code of Prof’l Ethics, *Final Report of the Committee on Code of Professional Ethics*, 33 ANN. REP. AM. BAR ASS’N 567, 569 (1908)).

40. *Id.* at 182 (citing Edmund B. Spaeth, Jr., *To What Extent Can a Disciplinary Code Assure the Competence of Lawyers?*, 61 TEMP. L. REV. 1211, 1218 (1988)).

41. *Id.* (quoting Spaeth, *supra* note 40) (“The Model Code was the legal profession’s first attempt to make competence compulsory.”).

42. *Id.* (quoting MODEL CODE OF PROF’L RESPONSIBILITY DR 6-101(A) (1969) (“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.”)).

43. *Id.* at 183.

44. Model Rule 1.1 attempts to provide a vague definition of competence. *See id.* at 183, 183 n.32 (quoting Sutton, *supra* note 38, at 422 (“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.”)).

the 1983 version adopted Model Rule 1.6 (Duty of Confidentiality), which is often analyzed in tandem with Model Rule 1.1.[45]

Some scholars have suggested that the definition of competence is intentionally vague so that attorneys can adapt the definition to various situations while possessing a knowledge base expected of all attorneys.[46] As practitioners argue for a more clearly defined view of technology competence in the professional ethics guidelines, some scholars and lawyers assert that the ABA intentionally used vague language[47] to address inherent change in the profession implicitly.[48]

The ABA's incorporation of vague language has encouraged the efficient practice of law through the appropriate use of available technology.[49] This concept dates to the *1908 Canons*. Its preamble underscores the importance of efficiency, describing it as "peculiarly essential" in any "system for establishing and dispensing justice."[50] In 1979, the ABA Task Force on Lawyer Competency included

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45. Kuehl, *supra* note 2, at 6 (citing ABA Comm. on Ethics & Prof'l Responsibility, Formal Op. 99-413 (1999)).

46. *See* Sutton, s*upra* note 38, at 422.

47. Two recent examples of vagueness in the *Model Rules* are related to lawyer speech and misconduct. *See* Josh King, Chief Legal Officer, Avvo. Inc., Commentary at ABA Standing Comm. on Ethics and Prof'l Responsibility, In re: Association of Professional Responsibility Lawyers Proposed Amendments to ABA Model Rules of Professional Conduct 7.1, 7.2, 7.3, 7.4 (Feb. 3, 2017) (citing Avvo, Inc.'s argument that Model Rule 7.2 on the "specific restrictions on lawyer advertising" is vague and unnecessary because the regulation of lawyer advertising is already defined by Model Rule 7.1) (transcript available at https://www.americanbar.org/content/dam/aba/administrative/professional_responsibility/aprl_public_forum_transcript.pdf [https://perma.cc/2J6G-GN4D], at 44); *see also* Josh King, Chief Legal Officer, Avvo, Inc., Comments to ABA Standing Comm. on Ethics and Prof'l Responsibility (Feb. 28, 2018), (available at https://www.americanbar.org/content/dam/aba/administrative/professional_responsibility/avvo_comments.pdf [https://perma.cc/7Z6M-856Y]). For further discussion on the vagueness of Model Rule 8.4(g) (Misconduct), see generally Ethan W. Blevins, Donald Patrick Eckler & Daniel M. Ortner, *Ethics: Model Rule 8.4(g) and Constitutional Limits on Regulating Attorney Expression of Unpopular Positions*, https://www.pretzel-stouffer.com/wp-content/uploads/2021/04/Program-Slides-2.pptx [https://perma.cc/M3U9-QM5D] (citing examples of vague language in the Model Rule and Comments); David L. Hudson, Jr., *Ethics Opinion Helps Define ABA Guidance on Professional Misconduct*, ABA J. (Oct. 1, 2020), https://www.abajournal.com/magazine/article/opinion-helps-define-the-reach-and-scope-of-aba-model-rule-84g [https://perma.cc/2GWH-CGWK] (quoting Leslie C. Levin) ("Rule 8.4(g) as written is extremely broad.").

48. It is standard practice for the ABA to draft vague language in the *Model Rules* and subsequently release opinions that attempt to refine or clarify the language. *See* Hudson, *supra* note 47 (quoting Leslie C. Levin) ("Formal Opinion 493 helps explain the limits of the rule in some respects."). For a discussion on how vague, implicit language considers changes in technology, see Johnson, *supra* note 8, at 168 (noting that while technology competence was implicitly required in pre-existing Comment 6 to Model Rule 1.1, a new comment specifically addressing technology was required to make this requirement explicit).

49. *See* Baker, *supra* note 33, at 560 ("The amended language found in Comment 8 is amorphous. This vague language was purposeful, as the Chief Reporter of the ABA Commission on Ethics 20/20—the Commission that was responsible for the amended language—explained, 'the specific skills lawyers will need in the decades ahead are difficult to imagine.'"). *Contra* Johnson, *supra* note 8, at 162–63 ("Despite the adoption of Comment 8 by a majority of states and an increase in state ethics opinions interpreting it, nowhere does less clarity exist concerning the applicability of Comment 8 than in the realm of transactional lawyering. . . . [R]esearch shows that a lack of appropriate guidance from the ABA has frustrated the broad purpose of Comment 8, thereby potentially discouraging lawyers from adopting helpful technology, and limiting lawyers' ability to innovate and improve efficiency.").

50. Haight *supra* note 21, at 184 (quoting CANONS OF PROF'L ETHICS pmbl. (1908)).

"the ability to organize and manage legal work" in its definition.[51] The drafted Comments to Model Rule 1.6 adopted in 1983 expressed a need for attorneys to "act competently to safeguard information relating to the representation of a client against unauthorized access by third parties."[52] More recently, the ABA Commission on Ethics suggested that a duty of technological competence was already implicitly encompassed in Model Rule 1.1.[53]

Formal guidance on the ethical use of technology in legal practice initially reached the profession at the state level.[54] As the practice of law transformed into an information-based profession and attorneys adapted information-sharing techniques, individual bar associations and regulators released ethics opinions to address these technology issues explicitly.[55] In 1999, the ABA explicitly provided its first technology-related guidance in Formal Opinion 99-413.[56] Formal Opinion 99-413 addressed the need to protect the confidentiality and the use of encrypted and unencrypted email.[57] It explained that unencrypted email communication was akin to communication by phone, fax, and commercial mail, and it was not always necessary for lawyers to seek permission to use email.[58] Instead, lawyers would need to analyze the sensitivity level of each communication, the cost of disclosure, and, where applicable, find a more secure form of communication.[59]

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51. *Id.* (quoting AM. BAR ASS'N SECTION OF LEGAL EDUC. & ADMISSIONS TO THE BAR, REPORT AND RECOMMENDATIONS OF THE TASK FORCE ON LAWYER COMPETENCY: THE ROLE OF THE LAW SCHOOLS 9–10 (1979)).

52. Kuehl, *supra* note 2, at 6 (quoting MODEL RULES R. 1.6).

53. Johnson, *supra* note 8, at 168 (asserting that the Commission suggested that a duty of technological competence was already implicitly encompassed in Model Rule 1.1, but the Commission decided to make "explicit" the duty to understand the "benefits and risks" of relevant technology). *See generally* COMM'N ON ETHICS 20/20, AM. BAR ASS'N [hereinafter ABA COMM'N 20/20], REPORT TO THE HOUSE OF DELEGATES 105A Revised (2012), https://www.americanbar.org/content/dam/aba/administrative/ethics_2020/20120808_revised_resolution_105a_as_amended.pdf [https://perma.cc/G9P9-3PZM].

54. *See* Kuehl, *supra* note 2, at 14–29; Johnson, *supra* note 8, at 171–74.

55. *See* Haight, *supra* note 21, at 87–88.

56. *See* Kuehl, *supra* note 2, at 6–7 (citing ABA Comm. on Ethics & Prof'l Responsibility, Formal Op. 99-413 (1999)).

57. *See* ABA Comm. on Ethics & Prof'l Responsibility, Formal Op. 99-413 (1999) ("A lawyer may transmit information relating to the representation of a client by unencrypted e-mail sent over the Internet without violating the Model Rules of Professional Conduct.").

58. *See id.* ("The same privacy accorded U.S. and commercial mail, land-line telephonic transmissions, and facsimiles applies to Internet e-mail.").

59. *Id.* ("A lawyer should consult with the client and follow her instructions, however, as to the mode of transmitting highly sensitive information relating to the client's representation."). Formal Opinion 99-413 would later be updated in May 2017 by Formal Opinion 477R, which states:

> A lawyer generally may transmit information relating to the representation of a client over the internet without violating the Model Rules of Professional Conduct where the lawyer has undertaken reasonable efforts to prevent inadvertent or unauthorized access. However, a lawyer may be required to take special security precautions to protect against the inadvertent or unauthorized disclosure of client information when required by an agreement with the client or by law, or when the nature of the information requires a higher degree of security.

ABA Comm. on Ethics & Prof'l Responsibility, Formal Op. 477R (2017).

In 2009, the President of the ABA empaneled the Commission on Ethics 20/20 ("Commission 20/20") to ensure the rules were on "pace with social change and the evolution of law practice"[60] and "to keep pace in this age of computers, technology, and the internet."[61] Accordingly, the Commission opened a feedback comment period and held open meetings and public hearings.[62] The available notes from the October 15, 2010 meeting reflect comments about technology and client demand, confidentiality, client data storage concerns, and that "new technologies are forcing lawyers to collaborate more with clients and colleagues in the performance of their duties."[63]

At the end of the three-year study, the Commission 20/20 made several recommendations for amendments to the *Model Rules*, and the ABA subsequently accepted six.[64] The recommendations now explicitly state that attorneys must understand the benefits and risks associated with the use of relevant technology in the practice of law.[65] One of the accepted amendments, a revision of Comment 8 to Model Rule 1.1,[66] was subsequently adopted by the ABA House of Delegates in 2012.[67] Model Rule 1.1 states: "A lawyer shall provide competent representation to a client. Competent representation requires the legal knowledge, skill, thoroughness and preparation reasonably necessary for the representation."[68] Comment 8 reads: "To maintain the requisite knowledge and skill, a lawyer should keep abreast of changes in the law and its practice, *including the benefits and risks associated with relevant technology*, engage in continuing study and education and comply with all continuing legal education requirements to which the lawyer is subject."[69]

The accompanying report by the Commission 20/20 provided further guidance on Comment 8 and the application of technology competence by including the obligation to protect confidential information, email, and electronic document creation.[70] Some scholars posit that the language of Comment 8 still requires

60. Haight, *supra* note 21, at 183–84 (quoting ABA COMM'N 20/20, INTRODUCTION AND OVERVIEW 1 (2012), https://www.legalethicsforum.com/files/20120508_ethics_20_20_final_hod_introdution_and_overview_report.pdf [https://perma.cc/2FRC-8BF8]).

61. Baker, *supra* note 33, at 559 (first citing Lauren Kellerhouse, *Comment 8 of Rule 1.1: The Implications of Technological Competence on Investigation, Discovery, and Client Security,* 40 J. LEGAL PROF. 291, 292–93 (2016); and then citing Ronald D. Rotunda, *Applying the Revised ABA Model Rules in the Age of the Internet: The Problem of Metadata,* 42 HOFSTRA L. REV. 175, 175–76 (2013)).

62. Johnson, *supra* note 8, at 167.

63. *Id.*; *see Meeting Minutes*, ABA COMM'N 20/20 7 (Oct. 15, 2010), https://www.americanbar.org/content/dam/aba/administrative/ethics_2020/20101510_minutes.pdf [https://perma.cc/H4QJ-28L7].

64. Baker, *supra* note 33, at 559.

65. Johnson, *supra* note 8, at 168 (citing ABA COMM'N 20/20, *supra* note 53, at 8).

66. Baker, *supra* note 33, at 559 (quoting Kellerhouse, *supra* note 61, at 293).

67. *Id.* at 560.

68. MODEL RULES R. 1.1.

69. MODEL RULES R. 1.1 cmt. 8 (emphasis added).

70. Johnson, *supra* note 8, at 169. *See generally* ABA COMM'N 20/20, REPORT TO THE HOUSE OF DELEGATES 105A (2012), https://www.americanbar.org/content/dam/aba/administrative/ethics_2020/2012_hod_annual_meeting_105a_filed_may_2012.pdf [https://perma.cc/R6SQ-SMW3].

further clarity for proper application.[71] However, one of the former Commission 20/20 members commented that the Commission drafted an amendment as a structural change that "created a framework to address future issues."[72]

Yet, in 2017, the ABA issued Formal Opinion 477R, which addressed the ethical duties and competencies surrounding cloud and other alternative data storage options, electronic communication, wireless internet, passwords, virtual private networks ("VPN"), and cybersecurity.[73]

The ABA issued several other Formal Opinions designating specific ethical guidelines that have implications on legal practice and technology use. In 2018, the ABA issued Formal Opinion 482, which addressed ethical obligations related to communication and available technology post-disasters.[74] Two years later, the ABA issued Formal Opinion 495, which addressed remote work in jurisdictions where a lawyer may not be licensed.[75] In 2021, the ABA issued Formal Opinion 498, which offers concrete definitions for a virtual practice.[76]

B. STATE BAR REQUIREMENT

The ABA's issuance of amended language to the *Model Rules* does not automatically force all attorneys in all jurisdictions to comply. Instead, the language is only seen as guidance until a state formally adopts the *Model Rules*, obliging attorneys in that specific jurisdiction to comply.[77] To date, forty states have adopted the duty of technology competence.[78] Most recently, the Supreme Court of Hawaii did so in 2021 (effective January 1, 2022).[79] Even though a state adopts the duty of technology competence, the state is not required to adopt the exact

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71. Johnson, *supra* note 8, at 169–70; Baker, *supra* note 33, at 559–60.

72. Johnson, *supra* note 8, at 169–70. For an in-depth discussion on structural changes made by the Commission 20/20, see *infra* Part IV; Laurel S. Terry, *Globalization and the ABA Commission on Ethics 20/20: Reflections on Missed Opportunities and the Road Not Taken*, 43 HOFSTRA L. REV. 95, 105 (2014).

73. For more discussion, see ABA Comm. on Ethics and Prof'l Responsibility, Formal Op. 477R (2017); Dennis Kennedy, *2020 Cloud Computing*, ABA TECHREPORT 2020 (Oct. 26, 2020), https://www.americanbar.org/groups/law_practice/publications/techreport/2020/cloudcomputing/ [https://perma.cc/QN4M-AH5T]; Kuehl, *supra* note 2, at 7–9.

74. *See* ABA Comm. on Ethics and Prof'l Responsibility, Formal Op. 482 (2018) (discussing ethical obligations related to disasters).

75. *See* ABA Comm. on Ethics and Prof'l Responsibility, Formal Op. 495 (2020).

76. Virtual practice is a "technologically enabled law practice beyond the traditional brick-and-mortar law firm." *See* ABA Comm. on Ethics and Prof'l Responsibility, Formal Op. 498 (2021).

77. Baker, *supra* note 33, at 561; *see also* ABA Comm. on Ethics and Prof'l Responsibility, Formal Op. 495 (2020) (addressing remote work by attorneys residing in jurisdictions where they are unauthorized to practice law).

78. Ambrogi, *supra* note 33.

79. *See id.* (discussing how the Hawaii Supreme Court adopted the revision by order dated Aug. 18, 2021, effective Jan. 1, 2022). The order also amended Comment 2 to Model Rule 5.3, Responsibilities Regarding Nonlawyer Assistants, to state: "[r]easonable efforts should include careful consideration of the use of technology and office resources connected to the internet, external data sources, and external vendors providing services relating to client data, and the use of client data." *See* Order Amending the Hawai'i Rules of Professional Conduct, SCRU-11-0001047 (2021), https://www.lawnext.com/wp-content/uploads/2022/03/2021_hrpcond1.1_1.4_1.15_5.3am_ada.pdf [https://perma.cc/PLP4-RPCS].

language of the *Model Rules*.[80] A few states have made their adopted rules more specific,[81] adding explanatory language to Comment 8.[82]

Conversely, other states have (1) remained silent on adopting comments,[83] (2) not adopted comments at all,[84] or (3) clarified that comments are only published as a convenience.[85] Finally, a few states have tried to fill some gaps left by Model Rule 1.1 and Comment 8's nebulous adopted language by issuing their own state ethics advisory opinions on technology.[86] A few state bar associations are concerned that the ever-changing nature of technology results in outdated language if the language is too specific.[87]

C. PROFESSIONAL DEVELOPMENT FOR ATTORNEYS

Most jurisdictions now require attorneys to fulfill Mandatory Continuing Legal Education ("CLE") credits.[88] The increased number of technology trainings across all jurisdictions that offer CLE credits directly results from the increased value of technology training to law firms and attorneys.[89] Private companies, professional associations,[90] state and county bar associations, and other legal

80. Baker, *supra* note 33, at 561–62.

81. *See id*. at 562 (discussing New York, Colorado, West Virginia, Florida, and North Carolina); Ambrogi, *supra* note 33 (offering a comprehensive website for full adoption language by state).

82. Haight, *supra* note 21, at 187; Johnson, *supra* note 8, at 171.

83. Johnson, *supra* note 8, at 171–72 (noting that Louisiana has not adopted the comments, and its rules are silent about them). *See generally* LA. RULES OF PROF'L CONDUCT (2019).

84. Johnson, *supra* note 8, at 172 (noting that Montana appears not to have adopted the comments, but the preamble to its rules includes the "guidance" language); *see* MONT. RULES OF PROF'L CONDUCT pmbl. ¶ 15 (2016).

85. Johnson, *supra* note 8, at 172 (noting that Minnesota, New Hampshire, New York, and Wisconsin publish the comments, but that they are not endorsed or adopted). *See generally* MINN. RULES OF PROF'L CONDUCT (2018); N.H. Sup. Ct. Ord. (July 25, 2007) (repealing and replacing New Hampshire Rules of Professional Conduct); N.H. RULES OF PROF'L CONDUCT Statement of Purpose (2018); N.Y. RULES OF PROF'L CONDUCT (2018); WIS. RULES OF PROF'L CONDUCT FOR ATT'YS scope (2017).

86. 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." N.Y. RULES OF PROF'L CONDUCT R. 1.1 cmt. 8; *see also* Haight, *supra* note 21, at 187. North Carolina added similar language, requiring competence "with the technology relevant to the lawyer's practice." N.C. RULES OF PROF'L CONDUCT R. 1.1 cmt. 8 (2014); *see also* Haight *supra* note 21, at 187.

87. Haight, *supra* note 21, at 188 (quoting Iowa State Bar Ass'n, Ethics Op. 11-01 (2011) ("[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.")).

88. CLE sessions offer continued professional education opportunities for those interested in preserving their licensure in the state. *CLE FAQs for Newly-Admitted Attorneys*, AM. BAR ASS'N, https://www.americanbar.org/events-cle/mcle/new-lawyers/cle-faqs-for-new-lawyers/ [https://perma.cc/AM6D-B83L] (last visited Oct. 4, 2022).

89. Kuehl, *supra* note 2, at 219; *MCLE Rules by Jurisdiction*, AM. BAR ASS'N, https://www.americanbar.org/events-cle/mcle/ [https://perma.cc/XL63-G7G4] (last visited Feb. 16, 2022).

90. For example, the ABA offers training through its CLE Member Benefit Library. *See CLE Marketplace*, AM. BAR ASS'N, https://www.americanbar.org/cle-marketplace/ [https://perma.cc/25PV-35NR] (last visited Mar. 31, 2022).

institutions across the country offer CLE events in-person and virtually.[91] Practicing attorneys may also engage in intensive legal technology training, certification, assessment,[92] or in specialized technology training programs.[93] Finally, practicing attorneys seeking a more intense legal technology training program may elect to "go back" to school and complete a legal certificate program offered by an ABA-accredited school.[94]

Training alone does not create a competent attorney per Model Rule 1.1.[95] Throughout the twentieth century, attorneys have attempted to create a formula or idyllic prototype of what skill sets should be present in a fully competent

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91. For example, the South Carolina State Bar Association and the New York State Bar Association offered a limited number of CLE trainings in law schools in Spring 2022. The South Carolina bar offered "Masters in Trial: A Trial Demonstration from Opening Statement Through Jury Deliberations" at the University of South Carolina. *Masters in Trial: A Trial Demonstration from Opening Statement through Jury Deliberations*, S.C. BAR, https://cle.scbar.org/Seminars/Info/sessionaltcd/0222_07 [https://perma.cc/QHR4-5FZQ] (last visited Feb. 16, 2022). The New York State Bar Association offers Commercial Arbitration and Commercial Mediation Training at Fordham Law School. *Commercial Arbitration Spring 2022*, N.Y. STATE BAR ASS'N, https://nysba.org/events/commercial-arbitration-spring-2022/ [https://perma.cc/HU32-G2E4] (last visited Oct. 4, 2022); *3-Day Commercial Mediation Training – Spring 2022*, N.Y. STATE BAR ASS'N, https://nysba.org/events/3-day-commercial-mediation-training-spring-2022/ [https://perma.cc/63P6-W45Y] (last visited Feb. 16, 2022). The New York State Bar Association also offers Trial Academy at Syracuse Law School. *Trial Academy 2022*, N.Y. STATE BAR ASS'N, https://nysba.org/events/trial-academy-2022/ [https://perma.cc/7TWM-5NNJ] (last visited Feb. 16, 2022).

92. Sometimes, these programs are offered at law schools and purchased with technology fees or library funds. The fund allocation often reflects the commitment level of the overall institution to teaching technology within the legal curriculum. Such programs include the Procertas Legal Technology Assessment, *Legal Technology Assessment*, PROCERTAS, https://www.procertas.com/products/lta/ [https://perma.cc/KSV9-HWZT] (last visited Feb. 16, 2022); the Legal Technology Core Competencies Certification ("LTC4"), *LTC4 | Legal Technology Core Competencies Certification Coalition*, LTC4, https://ltc4.org/ [https://perma.cc/6WZA-S2EQ] (last visited Feb. 17, 2022); the Global Legal Technology & Innovation Certificate ("LTIC"), *Legal Technology & Innovation Certificate*, LTI.INSTITUTE, https://lti.institute/ltic/ [https://perma.cc/Z3YL-P4WA] (last visited Feb. 17, 2022); and the NSLT (National Society for Legal Technology) Legal Office Technology Certificate, *NSLT Legal Office Technology Certificate*, www.LegalTechSociety.org, https://legaltechsociety.org/Professional [https://perma.cc/5AW7-MGP2] (last visited Feb. 17, 2022).

93. Examples of specialized technology training programs include the eDiscovery Technology Certificate ("eDTech"), Cybersecurity Leadership for Non-Technical Executives, and the Law of Data Security and Investigations. For further discussion, see *Cybersecurity Programs*, MIT MGMT. EXEC. EDUC., https://programs.emeritus.org/mit-sloan/cybersecurity-programs.php?utm_source=Google&utm_medium=c&utm_term=cybersecurity%20training%20program&utm_location=9010488&utm_campaign=B-365D_US_GG_SE_CYB_GENERIC_RoUS&utm_content=Core&gclid=CjwKCAjw49qKBhAoEiwAHQVTo71pQn8L49T732VMNqer-4f4PPWOt071PiEX9AolBuEJYxUDMZwXqRoC9vEQAvD_BwE [https://perma.cc/3T42-WTMA] (last visited Feb. 17, 2022); *LEG523: Law of Data Security and Investigations*, SANS INST., https://www.sans.org/cyber-security-courses/cybersecurity-law-data-security/ [https://perma.cc/XJ53-GFDG] (last visited Feb. 17, 2022).

94. Several schools offer certificates in, or related to, technology. *Online Master of Legal Studies Programs*, 2U INC., https://onlinemasteroflegalstudies.com/resources/legal-certificates [https://perma.cc/E87F-3TX3] (last visited Dec. 19, 2021).

95. Model Rule 1.1 states: "[a] lawyer shall provide competent representation to a client. Competent representation requires the legal knowledge, skill, thoroughness and preparation reasonably necessary for the representation." MODEL RULES R. 1.1.

attorney.[96] These prototypes (often called "lawyering competency models") have changed over time. With increased pressure from the ABA and client expectations for efficient lawyering, lawyers must be technologically proficient to meet professional competency standards.

D. LAWYERING COMPETENCY MODELS AND THE RISE OF TECHNOLOGY COMPETENCY TO MEET CLIENT NEEDS

In the previous section, we discussed how technology skills are explicitly stated in recent ethical guidelines. Similarly, the competency models address the expectations of incorporating technology skills in lawyering over time. In this section, we briefly explore these models, how legal positions reflect the need for technology competency, and how law schools have attempted to address technology training to meet the duty of competence.

Until the late nineteenth century, lawyers were generalists who often served in advisory roles.[97] The informal apprenticeship system was the only way an individual could enter the profession[98] until there was an opportunity to offer standardized education through the case method approach that allowed for mass entry into the profession.[99] However, a few elite institutions that provided systematic legal doctrine training did not attempt to go beyond a generalist legal education.[100]

1. THE I-SHAPED LAWYER MODEL

At the turn of the twentieth century,[101] federal and state governments created and amended regulations[102] to address economic growth.[103] As regulations became more complex, lawyers developed specialties and became experts in their fields.[104] By the middle of the twentieth century, lawyers offered bespoke

96. *See infra* Part I.D.

97. William D. Henderson, *Three Generations of U.S. Lawyers: Generalists, Specialists, Project Managers*, 70 MD. L. REV. 373, 374 (2011); *see also* Smathers, *supra* note 14.

98. Henderson, *supra* note 97, at 375. This process is still used today in some state systems.

99. For more information on Christopher Columbus Langdell and the case method approach to legal education at Harvard, see generally Russell L. Weaver, *Langdell's Legacy: Living with the Case Method*, 36 VILL. L. REV. 517 (1991); Martha Minow, *Marking 200 Years of Legal Education: Traditions of Change, Reasoned Debate, and Finding Differences and Commonalities*, 130 HARV. L. REV. 2279 (2017).

100. Henderson, *supra* note 97, at 375.

101. *Id*. at 373.

102. For example, the Pure Food and Drug Act of 1906 was the first comprehensive federal regulation of food and medicine. *See* Oscar E. Anderson, Jr., *Pioneer Statute: The Pure Food and Drugs Act of 1906*, 13 J. PUB. L. 189, 189 (1964). Similarly, in 1911, the Legislature of New York created the Factory Investigating Commission to investigate manufacturing conditions. The commission championed the amendment of the state's occupational safety and health code. *See The New York Factory Investigating Commission*, U.S. DEP'T OF LABOR, https://www.dol.gov/general/aboutdol/history/mono-regsafepart07 [https://perma.cc/PUR5-K838] (last visited Feb. 17, 2022).

103. Henderson, *supra* note 97, at 378.

104. Susan Duncan, *Are You a T- or I-Shaped Lawyer?*, RAINMAKING OASIS 2 (May 14, 2016), https://rainmakingoasis.com/wp-content/uploads/2016/08/Are-You-a-T-or-I-Shaped-Lawyer.pdf [https://perma.cc/Z5UF-DFNR].

services: one-on-one and tailored to individual clients in the view that every situation was unique.[105] Traditional lawyers are "I-shaped": trained and rewarded for a depth of knowledge in their narrow subject specialties.[106] While track records and successes are still highly valued, current law firms have responded to client needs and have marketed themselves as moving away from the classic I-shaped model.[107] This change forced lawyers to adapt and develop new skills, paving the way for new competency models.[108]

2. THE T-SHAPED LAWYER MODEL

R. Amani Smathers coined the concept of the T-shaped lawyer[109] to describe how the focus of legal practice has expanded beyond a deep legal expertise.[110] Current legal education does not sufficiently prepare law school graduates to master the T-shaped lawyer competencies and the technology skills to meet current legal practice needs.[111] This model recognizes that attorney success requires a strong understanding of legal skills combined with knowledge, though not as deep as their knowledge in law, in related fields such as project management, data analytics, and technology.[112] Although becoming an expert coder, hacker, or bitcoin master is not necessary, lawyers of the future need to understand how these industries align with their client's interests.[113]

3. THE DELTA MODEL

Recognizing that the legal profession needed to align with client interests, Natalie Runyon and Alyson Carrel established the Delta model to encourage

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105. *See* Smathers, *supra* note 14, at 34.

106. *Id.*

107. For example, see *ETA/Search Funds*, HMB LEGAL COUNS., https://hmblaw.com/experience/business-and-finance/eta-search-funds/ [https://perma.cc/WD26-NPYB] ("We eschew the classic 'I' shaped lawyer model with expertise that's an inch wide and a mile deep because that model doesn't suit today's searcher. Instead, we embrace the client's true need for a lawyer who is 'a mile wide and a mile deep.'").

108. *Id.*

109. ELAINE MAK, THE T-SHAPED LAWYER AND BEYOND: RETHINKING LEGAL PROFESSIONALISM AND LEGAL EDUCATION FOR CONTEMPORARY SOCIETIES 1 (2017); *see also* Smathers, *supra* note 14, at 37.

110. Smathers, *supra* note 14, at 33. Under this model, lawyers acquired generic business, leadership, and soft skills, including design thinking, project management, process improvement, and risk management. *See* Peter Conner, *The T-Shaped Lawyer*, 35 No. 6 ACC DOCKET 36, 40–42 (2017); *see also* Tom Martin, *How Chatbots Make for Lawyer Soft Skills*, 36 GPSOLO 57 (2019); Karolina Jackowicz, *T-shaped Lawyer: Who, What, How? Part 2/2 (004)*, CEE LEGAL TECH (Dec. 23, 2019), https://ceelegaltech.com/t-shaped-lawyer-who-what-how-part-2-2-004-2/ [https://perma.cc/239Y-6HJU]; *T-Shaped Lawyer: The New Skills Every Future Lawyers Need to Succeed*, IE L. SCH. (Apr. 10, 2019), https://www.ie.edu/law-school/news-events/news/t-shaped-lawyers-taking-legal-industry [https://perma.cc/646D-W2AY] ("This [additional] field of knowledge could range from technology, business, and analytics to human resources, politics, or more.").

111. *See infra* Part III.

112. Alyson Carrel, *The Delta Model: A Framework for Reimagining the Legal Profession Pipeline*, L. INSIDER, (July 24, 2020), https://www.lawinsider.com/resources/featured/the-delta-model-a-framework-for-reimaging-the-legal-profession-pipeline [https://perma.cc/2WPG-C5GA].

113. *See* IE L. SCH., *supra* note 110, at 3.

lawyers to gain skills in technology, the business of law, and emotional intelligence.[114] The Delta model reinforces the necessity of balancing the practice, the process, and the people, explicitly stating that technology competency is crucial to ensure the delivery of effective and efficient legal services.[115]

4. THE O-SHAPED LAWYER

In the United Kingdom, Dan Kayne established the "O-shaped" lawyer model.[116] The framework of the O-shaped lawyer model recognizes five behaviors and mindsets: optimism, ownership, open-mindedness, originality, and opportunism.[117] The original and opportunistic nature of the O-shaped lawyer encourages holistic problem solving, fosters innovation, and highlights technology competency.[118]

5. THE WHOLE LAWYER MODEL

In 2021, the Institute for the Advancement of the American Legal System at the University of Denver developed a "Foundations" hiring guide for employers who wanted to improve quality, retention, and diversity in their hiring practices.[119] The hiring guide asserts that law schools can prepare new lawyers for practice by training candidates based on the foundations that make the "Whole Lawyer" instead of a narrow set of criteria only rooted in tradition.[120] The Whole

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114. Natalie Runyon & Alyson Carrel, *The Evolution of In-House Counsel*, THOMSON REUTERS, https://legal.thomsonreuters.com/en/insights/articles/evolution-of-in-house-legal-counsel-delta-model [https://perma.cc/XW6W-CUKL] (last visited Feb. 23, 2022); *see also* Alyson Carrel, *Legal Intelligence Through Artificial Intelligence Requires Emotional Intelligence: A New Competency Model for the 21st Century Legal Professional*, 35 GA. STATE U. L. REV. 1153, 1153 (2018). These additional value systems met client demand and would more comprehensively reflect the diverse skills, attitudes, and knowledge that lawyers need.

115. Jessica de Perio Wittman & Kathleen "Katie" Brown, *2020, The Year of Distance Ed: Moving Online ≠ Increased Tech Competency Instruction*, CALICON 2021, at 02:36 (June 6, 2021), https://2021.calicon.org/node/1/sessions/2020-year-distance-ed-moving-online-%E2%89%A0-increased-tech-competency-instruction [https://perma.cc/3EHE-LFT4].

116. Dan Kayne is general counsel at Network Rail. Greg Bott, *Now Introducing the O-Shaped Lawyer*, CITY A.M. (Mar. 30, 2020), https://www.cityam.com/o-shaped-lawyer/ [https://perma.cc/9SZZ-EGWE]. The O-shaped lawyer competence model emphasizes a humanist approach to effective legal services focused on treating clients as people first.

117. Optimism is defined as creating a positive mindset that allows lawyers to be seen as business partners, not business blockers. Ownership is defined as lawyers taking more accountability for outcomes. Open-mindedness is defined as lawyers developing an open, growth mindset. Originality is defined as a progressive approach to problem solving through creativity and innovation. Opportunism is defined as lawyers becoming less risk-averse, allowing for business opportunities using technology. *See The O Shaped Lawyer*, O SHAPED LAWYER, https://www.oshapedlawyer.com/overview [https://perma.cc/PY3G-BRZZ] (last visited Feb. 23, 2022).

118. *Id.*

119. *See generally* INST. FOR THE ADVANCEMENT OF THE AM. LEGAL SYS., FOUNDATIONS: HIRING GUIDE (Apr. 12, 2021), https://iaals.du.edu/publications/foundations-hiring-guide [https://perma.cc/NL43-HZ3Q].

120. When employers hire new candidates based on what they actually need, they incentivize improvements in legal education. INST. FOR THE ADVANCEMENT OF THE AM. LEGAL SYS., FOUNDATIONS FOR PRACTICE: THE WHOLE LAWYER AND THE CHARACTER QUOTIENT (July 26, 2016), https://iaals.du.edu/publications/foundations-practice-whole-lawyer-and-character-quotient [https://perma.cc/ZSM4-TN2T] ("Employers lack

Lawyer model focuses on five learning outcomes (communicator, practitioner, professional, problem solver, and self-starter) and seventy-six Foundations.[121] The Foundations-based approach allows employers to look beyond credentials to competencies and capabilities and measure a candidate's qualifications through the seventy-six Foundations.[122]

E. TECHNOLOGY COMPETENCY REFLECTED IN LEGAL POSITIONS

The modern competency models reflect that law firms, legal departments, and clients are looking for attorneys who offer the "full package."[123] As a result, firms and legal departments hire holistic problem solvers who know how and when to leverage technology.[124] When successful, these holistic problem solvers foster innovation and create opportunities for alternative legal service providers to take on new, significant roles and responsibilities.[125] As a result, recent law graduates may find that their first J.D.-required (or J.D.-preferred) job may not have the traditional title of "associate."[126] Instead, students compete for positions such as Legal Knowledge Engineer, Legal Data Scientist, Legal Solutions Architect, or Legal Process Analyst.[127] For example, in Fall 2021, Cleary Gottlieb Steen & Hamilton was hiring Due Diligence Analysts "focused on building alternative models of legal services" while "work[ing] on M&A due diligence and other corporate transactional matters."[128] Job responsibilities included "using legal technology for data room management, project management and the review and

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confidence in the preparation of law graduates. . . . [The] Foundations for Practice [are] designed to . . . [a]lign market needs with hiring practices to incentivize positive improvements in legal education.").

121. While there is only one Foundation that specifically mentions technology (tech savvy), many of the remaining Foundations are often implemented in current legal practice using technology. For example, confidentiality, timekeeping, legal research, discovery, and contracts are a few of the Foundations that are facilitated through technology. *See* INST. FOR THE ADVANCEMENT OF THE AM. LEGAL SYS., *supra* note 119, at 5.

122. *Id*. at 9–10.

123. de Perio Wittman & Brown, *supra* note 115, at 03:11.

124. *Id*. at 03:17; Bott, *supra* note 116. *See generally* INST. FOR THE ADVANCEMENT OF THE AM. LEGAL SYS., *supra* note 119.

125. *See* O'Leary, *supra* note 21, at 207–08 (first citing GEO. L. CTR. ON ETHICS & THE LEGAL PRO., THOMSON REUTERS LEGAL EXEC. INST. & PEER MONITOR, 2020 REPORT ON THE STATE OF THE LEGAL MARKET 15 (2020), https://www.law.georgetown.edu/news/fundamental-shifts-are-disrupting-the-legal-market-2020-report-on-the-stateof-the-legal-market-from-georgetown-law-and-thomson-reuters-legal-executiveinstitute/ [https://perma.cc/5ZSG-RCVT]; then citing Dan Packel, *From California to D.C., These Are the Proposals for Reforming Law Firm Ownership*, AM. LAW. (Feb. 24, 2020) (available through LEXIS and Bloomberg Law); and then citing Sam Skolnik, *California Bar Trustees Move Toward New Regulatory 'Sandbox,'* BLOOMBERG L. (May 14, 2020, 5:50 PM), https://news.bloomberglaw.com/us-law-week/california-bar-trustees-move-toward-new-regulatory-sandbox [https://perma.cc/GMK5-8DRN]).

126. O'Leary, *supra* note 21, at 210.

127. *Id*.

128. The firm was hiring for ClearyX, a "separate business unit within the firm focused on building . . . unique combinations of technology, process and people to create efficient, high quality legal services and products to support the firm and its clients." *Due Diligence Analyst*, N.S. BARRISTERS' SOC'Y, https://nsbs.org/legal-profession/careers/due-diligence-analyst/ [https://perma.cc/5Q6Y-TKX4] (last visited Oct. 4, 2022); *see also infra* note 152.

analysis of legal documents . . . and the review and the development of knowledge databases."[129]

Similarly, in December 2021, Bloomberg LP sought a Legal Data Analyst. A J.D.-required position, the job's primary responsibilities included supporting feature developments that use artificial intelligence ("AI") and machine learning.[130] Additionally, several technology vendors hire J.D. graduates. For example, Rosen Litigation Technology Consulting has hired attorneys with technology skills as consultants.[131] In addition, vendors may network directly with law faculty to actively recruit students with technology know-how.[132] This shift in the legal marketplace paves the way for a new middle layer of professionals with a combination of law, technology, and business savvy.[133]

F. TECHNOLOGY COMPETENCY SKILLS IN LAW SCHOOLS

Legal scholarship recommends that attorneys possess the necessary combination of law, technology, and business savvy.[134] In this article, we focus on technology competency skills currently taught in law schools and how they may not be sufficient to meet the expectations of current legal practice. A recent survey conducted by Bloomberg Law reinforced the idea that law schools may not be properly preparing students for modern-day practice.[135] The 2022 Law School Preparedness Survey reported that 42% of attorneys wished that new arrivals learned legal technology, while 35% of attorneys wished that new arrivals were data literate.[136]

These results are not surprising. Law schools receive little to no guidance from bar associations about technology standards for legal education.[137] In recent

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129. N.S. BARRISTERS' SOC'Y, *supra* note 128; *see also infra* note 152.

130. Bloomberg LP, *Legal Data Analyst*, LINKEDIN, https://www.linkedin.com/jobs/view/legal-data-analyst-at-bloomberg-lp-2759270095/ [https://perma.cc/VV67-WQJ6] (last visited Sept. 23, 2022).

131. Alex Rosen encouraged one of the authors to promote vacancies for new consultants to graduating students in her Legal Technology for Practice course. Alex Rosen, Owner, Rosen Litig. Tech. Consulting, Inc., Guest Lecture at Charleston School of Law (July 13, 2021).

132. *Id.*

133. Anthony Volini, *A Perspective on Technology Education for Law Students*, 36 SANTA CLARA HIGH TECH. L.J. 165, 170 (2020) (citing Daniel Martin Katz, *The MIT School of Law? A Perspective of Legal Education in the 21st Century*, 2014 U. ILL. L. REV. 1431 (2014); Janine Ford, *Do Lawyers Need to Learn to Code?* LEGAL TECH WEEKLY (Mar. 19, 2019), https://contractbook.com/legaltechinstitute/do-lawyers-need-to-learn-to-code [https://perma.cc/N5Q8-X4ZA]; Daniel Solove, *Establishing a Robust Law School Educational Program for Privacy Law*, PRIV. + SEC. BLOG (Sept. 24, 2019), https://teachprivacy.com/establishing-robust-law-school-program-privacy-law/ [https://perma.cc/U9NW-7H7F]).

134. *See* Lawyering Competency Models, *supra* Part I.D.

135. Karen Miller-Kuwana & Linda Ouyang, *Analysis: Survey Grades Law Students' Preparedness for Practice*, BLOOMBERG L. (Jan. 31, 2022, 5:00 AM), https://news.bloomberglaw.com/bloomberg-law-analysis/analysis-survey-grades-law-students-preparedness-for-practice [https://perma.cc/TJR3-KK2X].

136. *Id.*

137. For example, Standard 302 discusses learning outcomes. There are two interpretations that offer guidance. Interpretation 302-1 specifically addresses other professional skills needed for competent and ethical participation in the legal profession but does not include technology. Interpretation 302-2 is so broad that no guidance is offered. ABA STANDARDS, *supra* note 20, at Standard 302, Interpretation 302-1, Interpretation 302-2.

years, legal educators presumed that law students had innate technology skills upon entering law school. These perceived technology skills were basic and included typing, word processing, and using email and the Internet.[138] In time, instructors observed that students needed basic as well as advanced technology training.[139] As a result, some law schools included legal technology skills and theory in the curriculum primarily through elective course offerings.[140] Nevertheless, there is no uniformity in these course offerings from school to school or even professor to professor at the same institution.[141]

For example, each author teaches a legal technology course at their respective institutions, where they cover a wide variety of topics ranging from e-discovery to courtroom presentation technology. However, there is no uniformity in the syllabi.[142] At Suffolk University, Dyane O'Leary offers a "how-to" guide for legal research and writing/legal practice faculty who wish to incorporate technology into their courses.[143] She centers on five broad categories of technology competence: (1) Legal Document Proficiency, (2) Legal Analytics & Document Integration/Brief Analysis, (3) E-Discovery, (4) Law Practice Technology, and (5) Data Security.[144] At DePaul, Anthony Volini proposes a core curricular priority of providing instruction on fundamental concepts in networking and programming with an emphasis on security.[145] Volini accomplishes this by "providing cross-listed IT courses to law students and/or providing customized 'for lawyers' courses" and/or "providing interdisciplinary law courses that teach and test on technology as an area of competence."[146] Volini compares law students who have taken courses on networking and programming with those whose education focuses exclusively on learning about the most recent legal practice tools from a user perspective or from studying the impact of technology on the legal industry. He asserts that students who have taken networking and programming courses will have a better foundation for understanding future technology developments.[147]

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138. Haight, *supra* note 21, at 190.

139. *See id*. at 190–91.

140. *Id*. at 191.

141. *Id*.; *see, e.g*., John Mayer, *Syllabi Commons*, CLASSCASTER, https://techforlawstudents.classcaster.net/syllabi-commons/ [https://perma.cc/PEW5-CFK2] (last visited Oct. 4, 2022); Rebecca Fordon, Faculty Services Librarian Lecturer in Law, University of California Los Angeles, unpublished research (on file with authors); *see also infra* Part III.

142. *See* Mayer, *supra* note 142; Haight, *supra* note 21, at 191; *see also infra* Part III.

143. *See generally* O'Leary, *supra* note 21.

144. *See id*. at 226–62.

145. Volini, *supra* note 133, at 165.

146. *Id*.

147. *See id*. at 172.

II. EMPIRICAL STUDIES ON TECHNOLOGY HIRING IN LAW FIRMS

Legal scholarship by academics and practitioners has often discussed the value of legal technology in practice and in preparation for the practice of law.[148] Articles and research projects have also addressed how law firms implement technology in their day-to-day operational practices.[149] Yet, little research identifies whether current positions at AmLaw100 firms require knowledge of legal technology.

In 2021, we curated data on technology-related positions at law firms in the AmLaw100.[150] Student research assistants mined information from various recruiter websites and the job opportunities, "About Us," and attorney profiles sections on law firm websites.[151] The initial data demonstrates that technology requirements, except in rare cases, are not held across the entire firm.[152] Instead, a law firm's technology requirement was often associated with specific practice areas and attorney positions that were revenue-driven.[153]

Although this project is ongoing, an initial analysis of this data confirms that forty-five law firms required technology skills for open attorney positions.[154] We initially observed trending positions in the software and the technology industry; cybersecurity and data privacy; internet, social media, and media and entertainment-

148. *See* discussion, *supra* Part I.

149. *See, e.g.*, Linna, *supra* note 29; Miller-Kuwana & Ouyang, *supra* note 135.

150. Jessica de Perio Wittman & Kathleen (Katie) Brown, Law Firm Data Mining Project (2021) (unpublished research) (on file with authors and the Georgetown Journal of Legal Ethics) [hereinafter 2021 Law Firm Data Mining Project]. We also used the same sample set of law firms and the innovation protocols from the Legal Services Innovation Index.

151. Terms used for data mining were those previously named in the work conducted by Linna (Alternative Fees: "alternative fee" OR "alternative fees" OR "AFA" OR "AFAs" OR "fixed fee" OR "fixed fees" OR "value-based billing" OR "value based pricing." Artificial Intelligence: "machine learning" OR "deep learning" OR "artificial intelligence." Project Management: "project management" OR "project manager" OR "project managers." Process Improvement and Innovation Framework: "lean thinking" OR "six sigma" OR "process improvement" OR "design thinking." Knowledge Management: "knowledge management" OR "knowledge engineering." Automation Basics: "expert system" OR "expert systems" OR "document automation" OR "document assembly" OR "process automation." Data Analytics: "data analytics" OR "predictive analytics" OR "decision tree" OR "decision trees" OR "data driven." Legal Operations: "Legal operations" OR "collaborative disaggregation." Proactive Law: "proactive law" OR "preventive law" OR "preventative law" OR "promotive law." Blockchain: "Blockchain" OR "smart contract" OR "smart contracts" OR "computable contract" OR "computable contracts") and (Alternative Fees, Artificial Intelligence, Client Education, Connectivity, Contract Management, Data Analytics, Document Assembly, Expert System, Incubator, Information Management, Innovation Entity, Knowledge Management, Process Improvement, and Project Management Services). 2021 Law Firm Data Mining Project, *supra* note 150.

152. These firms showed that technology skill was a requirement for all positions: Baker & Hostetler; Covington & Burling; Davis Wright Tremaine; Faegre Drinker Biddle & Reath; Fenwick & West; Fragomen, Del Rey, Bersen & Loewy; Goodwin Procter; King & Spalding; Polsinelli; Ropes & Gray; Sheppard, Mullin, Richter & Hampton; Sidley Austin; White & Case; and Wilmer Cutler Pickering Hale and Dorr. 2021 Law Firm Data Mining Project, *supra* note 150.

153. 2021 Law Firm Data Mining Project, *supra* note 150 (listing firms with overarching requirements and position specifications).

154. 2021 Law Firm Data Mining Project, *supra* note 150.

related technology; and e-discovery.[155] We observe these trends in practitioner projections that predict more acceleration in AI, automation, cybersecurity, client demand for more remote legal solutions, and alternative legal services (such as outsourcing work to e-discovery firms).[156]

This analysis closely aligns with the 2022 Report on the State of the Legal Market: A Challenging Road to Recovery, which discusses the legal market as a whole instead of focusing solely on technology.[157] Law firms must consider delivering remote services as a direct result of the COVID-19 pandemic.[158] Presently, there is an increasing number of legal services needed that require some technical knowledge.[159] We noted that this trend of requiring technical knowledge aligns with a hiring increase in the areas of corporate law, mergers and acquisitions, and real estate transactions.[160] In addition to hiring more attorneys and support staff, law firms are increasing their overhead expenses on technology: from November 2020 to November 2021, law firms increased their overhead expenses on technology from 1.8% to 7.1%.[161] Another tech-related overhead increase was in knowledge management and library services, which increased from 2.8% in 2020 to 4.6% in 2021.[162] This increase likely stems from the availability of legal technology tools created and updated during the pandemic to serve a fully-remote legal profession or meet a specific practice need.[163]

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155. Technology/software = 87 firms, Cybersecurity and data privacy = 73 firms, Data/technology = 35 firms, Media/internet/technology = 28 firms, and e-discovery = 25 firms. 2021 Law Firm Data Mining Project, *supra* note 150.

156. *See* Rachel Makinson, *5 Legal Trends to Look Out For in 2022*, LAW. MONTHLY (Dec. 9, 2021), https://www.lawyer-monthly.com/2021/12/5-legal-trends-to-look-out-for-in-2022/ [https://perma.cc/5AHJ-VS7C].

157. THOMSON REUTERS INST. & GEO. L. CTR. ON ETHICS & THE LEGAL PRO., 2022 REPORT ON THE STATE OF THE LEGAL MARKET: A CHALLENGING ROAD TO RECOVERY 2 (2022), https://www.thomsonreuters.com/en-us/posts/wp-content/uploads/sites/20/2022/01/State-of-Legal-Market-Report_Final.pdf [https://perma.cc/8FQB-UDJ9].

158. Ari Kaplan, *MyCase CEO Says Remote Work Is 'Here to Stay,'* ABA J. (Jan. 19, 2021, 8:41 AM), https://www.abajournal.com/columns/article/practice-management-and-the-future-of-remote-work [https://perma.cc/US26-2L43] ("Eighty percent of responding professionals reported investing in tools to work remotely in order to maintain their long-term business continuity and 46% have done so as a result of the pandemic."). *See generally* Nicole Black, *2021 Legal Industry Report: Lessons Learned from the Pandemic*, MYCASE, https://info.mycase.com/rs/196-INY-394/images/MyCase_2021-Industry-Report.pdf [https://perma.cc/PS5B-AUVH] (last visited Mar. 30, 2022).

159. *See* Matthew Doebler, *Re-Evaluating the Role of Technology in Consolidated and Complex Litigation*, LEGAL INTELLIGENCER, (Jan. 17, 2022), https://www.law.com/thelegalintelligencer/2022/01/17/re-evaluating-the-role-of-technology-in-consolidated-and-complex-litigation/?slreturn=20220230125021 [https://perma.cc/YHZ7-DUJW] (discussing how law practice during COVID requires re-evaluation of tools and techniques) ("[R]egardless of practice area, lawyers and judges have been forced to adopt technologies that had been overlooked for years.").

160. *See* THOMSON REUTERS INST. & GEO. L. CTR. ON ETHICS & THE LEGAL PRO., *supra* note 157, at 2.

161. *Id*. at 12.

162. *Id*.

163. *See* Doebler, *supra* note 159 (recommending technology that can assist multidistrict litigation, such as (1) webcasting to improve communication between plaintiff's leadership teams and lawyers who represent member plaintiffs, (2) courts webcasting litigation cases, (3) conducting depositions by Zoom to lower the common benefit expense that must be paid by settling plaintiffs, (4) crowdsourcing to determine payouts among the

A growing number of providers entering the marketplace now offer legal tech services.[164] Law firms now electing to develop legal-related technologies in-house may have contributed to this increase.[165] For example, Shearman & Sterling, Baker McKenzie, Ballard Spahr, Hogan Lovells, McGuire Woods, and White & Case have developed tech tools that use their law firm's data analytics to improve client services, predict litigation outcomes and billing, and develop a pricing matrix for alternative and fixed-fee arrangements in mergers and acquisitions deals.[166]

As the COVID-19 pandemic forces law firms to handle more electronic data, there is a dramatic increase in e-discovery services[167] and remote document review.[168] In December 2021, law firms' reported spending on cloud-based e-discovery and document review totaled $500 million.[169] Yet, the projected spend is estimated to be $14.7 billion in 2022.[170] In addition, spending may increase to at least $16.7 billion by 2024.[171] The growing investment in remote services, e-discovery, and document review will likely result in standardizing work processes to minimize the risk of inadvertent disclosure of client information.[172] The shift

settling plaintiffs post-settlement, (5) lawyers for member plaintiffs rating the ability of the plaintiff's leadership team).

164. *See generally* authors' discussion on Flaherty, *supra* note 13; Patrick Temple-West, *Law Firms Focus on Digital Skills to Ease Legal Pressures*, FIN. TIMES (Dec. 9, 2021), https://www.ft.com/content/a79c9f8f-ca0d-4cb1-9f41-86da4d2e64f9 [https://perma.cc/S7JJ-4S5D].

165. *See* Temple-West, *supra* note 164 (citing projections made by Needham & Co. analysts and IDC analysts).

166. *See id.* Additionally, Dentons; Borden Ladner Gervais; Fragomen, Del Rey, Bersen & Loewy; King & Spalding; and Morgan, Lewis & Bockius have all developed in-house technology tools to improve efficiency and processes at their firms. *Id.*

167. *See* Nicole Black, *Q&A Roundtable: The Future of Legal Technology*, L. PRAC. MAG. (Jan. 1, 2022). https://www.americanbar.org/groups/law_practice/publications/law_practice_magazine/2022/jf22/black/ [https://perma.cc/6FQR-CGVF]; Mark Clews & Corey Salm, *Advancements in Remote Collection Techniques*, AM. BAR ASS'N (Jan. 6, 2022) https://www.americanbar.org/groups/litigation/committees/class-actions/articles/2022/advancements-remote-collection-techniques/ [https://perma.cc/HU37-3PQV]. Nearly two-thirds of respondents selected discovery of collaboration app data (30.6%), followed by increased use of AI technology (17.8%) and increased use of cloud-based solutions (16.4%) as the biggest e-discovery-related trends to be addressed in 2022. Additionally, 30.0% of respondents found the lack of e-discovery competence continued to be a challenge and was not being talked about enough in the legal profession. *See* DOUG AUSTIN, EDISCOVERYTODAY 2022 STATE OF THE INDUSTRY REPORT 2 (2022).

168. 62.3% of respondents expected to continue to work remotely indefinitely. 20.6% expected a return to a hybrid/work-from-home environment. *See* Doug Austin, *2022 State of the Industry Report is Now Available! Here's How to Get It: eDiscovery Trends*, EDISCOVERYTODAY (Jan. 5, 2022), https://ediscoverytoday.com/2022/01/05/2022-state-of-the-industry-report-is-now-available-heres-how-to-get-it-ediscovery-trends/ [https://perma.cc/7SVA-K2VM].

169. *See* Temple-West, *supra* note 164.

170. *Id.*

171. *Id.*

172. Lourdes Fuentes Slater, Karta Legal LLC, Legal Process Improvement Through Lean Practices, Workshop at LegalWeek 2020 NYC (2020), https://assets.website-files.com/5cb0b06571c2a70d6460e2bc/5e50b9a82c16e8525506fbb3_legalweek2020-2.pdf [https://perma.cc/99D2-KELY]; Jeff Cox, UniCourt, *Data Trends in the Legal Industry: Embracing Data Classification Standards*, LEGALTECH NEWS (Feb. 23, 2022, 7:00 AM), https://www.law.com/legaltechnews/2022/02/23/data-trends-in-the-legal-industry-embracing-data-classification-standards/ [https://perma.cc/4JA8-ZBEE]; Isha Marathe, *E-Discovery Tools Could Better*

towards increased protection of client information through standardized practice will also come as states enact consumer protection regulations.[173] After law firms address regulatory protections through practice standardization, C-Suite technology leaders predict sustainability will be the most significant change to law firms by 2025.[174] Sustainability will surpass other topics, such as process automation, security, and risk, that need regulatory reform today.[175]

In evaluating law firm practice survey data, we infer that law firms generally require technology competency in revenue-driven attorney positions.[176] Therefore, it is not surprising to see law firms make a substantial financial commitment to billable initiatives such as e-discovery and document review. However, law firm operations, technology use, and client relations are not always billable.[177] Most lawyers are only interested in working on non-billable initiatives if they directly impact client relations.[178] Marketing, training, diversity initiatives, lateral and graduate recruitment, and knowledge management do not qualify under this category. Law firms and attorneys usually delegate these tasks to support staff or partners willing to do this work.[179] Due to this lack of interest, it is not surprising that law firm human resources and talent leaders foresee the creation of new roles in law firms, such as a director of marketing technology.[180] When surveyed about which technology professionals they would hire in the post-COVID environment, the leading firms reported that they are hiring in

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Prevent Inadvertent Disclosures—But Are They to Blame?, LEGALTECH NEWS (Aug. 11, 2022, 4:27 PM), https://www.law.com/legaltechnews/2022/08/11/e-discovery-tools-could-better-prevent-inadvertent-disclosures-but-are-they-to-blame/ [https://perma.cc/MJ2W-Y73K].

173. California, Colorado, and Virginia have adopted data privacy laws that are based on the General Data Protection Regulations ("GDPR"), with another six states currently considering other privacy legislation. Temple-West, *supra* note 164; *see also supra* notes 57, 61 (referencing ABA Formal Opinions that address measures to be taken to ensure confidentiality of client information).

174. *See* Katherine O'Keefe & Mike Pierides, *Technology Trends: Sustainability Is "In" for 2022 and Beyond*, TECH & SOURCING @ MORGAN LEWIS (Jan. 6, 2022), https://www.morganlewis.com/blogs/sourcingatmorganlewis/2022/01/technology-trends-sustainability-is-in-for-2022-and-beyond [https://perma.cc/7MBD-EQM8] (citing Isabelle Bousquette, *Sustainability Efforts Run Through Information Technology*, WALL ST. J. (Jan. 5, 2022, 7:00 AM), https://www.wsj.com/articles/sustainability-efforts-run-through-information-technology-11641384001 [https://perma.cc/D8HN-ZS83] ("In a recent survey conducted by the IBM Institute for Business Value, 42% of the 5,000 CIOs and CTOs polled said sustainability was the area where technology would have the biggest impact in their organization over the next three years.")) (explaining that efforts included in a sustainability initiative for a law firm are moving to the cloud, reducing consumption in existing data centers, using "green coding," and reviewing sourcing relationships).

175. O'Keefe & Pierides, *supra* note 174.

176. Revenue is typically generated through billable hours.

177. *See* THOMSON REUTERS INST. & GEO. L. CTR. ON ETHICS & THE LEGAL PRO., *supra* note 157, at 12.

178. *Id.* at 18.

179. *Id.*

180. Steve Nelson, *Technology-Related Legal Jobs Should Soar in Post-Covid Environment*, ATT'Y AT WORK, https://www.attorneyatwork.com/legal-hiring-trends-post-covid-legal-tech-jobs/ [https://perma.cc/54RM-6Z9M] (last visited Jan. 11, 2022) (quoting Dave Harvey, Senior Consultant with LawVision, as saying that a Director of Marketing Technology is a "sophisticated marketer who can interpret and distill data and use that to steer content strategy and thought leadership efforts").

finance and legal innovation as well as marketing and business development.[181] Law firms expect prospective hires to be competent in technology, law firm economics, and marketing.[182] Individuals best suited for these jobs should also have a strong understanding of clients' legal needs and must stay abreast of current and forthcoming technology to help solve clients' problems.[183] These skills align with the expectations set by the Delta and O-shaped lawyering competency models.[184] However, the optics of experienced attorneys delegating non-billable, but technology-laden, work to other support staff undermines the expectation that attorneys have an ethical obligation to be technologically competent. As the legal landscape evolves, it will be essential to emphasize technology competency. Otherwise, recent graduates will be caught off-guard when they are asked to incorporate practice-centric technology training in their daily work and collaborate with more IT professionals and information managers to address technology-related issues in modern-day practice.[185] This lack of technology competency will inevitably lead to inadequate service to their clients, which cuts to the core of the ethical competence requirement.[186]

III. EMPIRICAL STUDIES ON TECHNOLOGY OFFERINGS IN LAW SCHOOL CURRICULA

Technology training in legal education prioritizes theory. We posit that this results in an ethical dilemma. The ABA requires law schools to offer a rigorous legal education. However, without introducing both theory and practice, law students leave school without the necessary technology competency expected for the modern-day practice of law.[187]

The legal community has increasingly emphasized technological competence over the past decade. Attorneys and scholars have blogged about the topic.[188]

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181. *Id.*

182. *Id.*

183. *Id.*

184. See *supra* Part I.D for a discussion of how the Delta model reinforces the necessity to balance the practice, the process, and the people and rely on technology to ensure the delivery of effective and efficient legal services, as well as how the O-shaped lawyer model ensures a humanist approach to effective legal services, focusing on the approach of treating clients as people first and on five behaviors and mindsets: optimism, ownership, open-minded, original, and opportunistic. The original and opportunistic nature of the O-shaped lawyer fosters innovation and highlights technology competency.

185. Volini, *supra* note 133, at 165.

186. *See* Jennifer Wondracek, *Law Students—Avoid Malpractice and Embrace Technology!*, ABA STUDENT LAW. (Feb. 20, 2019), https://abaforlawstudents.com/2019/02/20/law-students-avoid-malpractice-and-embrace-technology/ [https://perma.cc/CBG5-RTWQ]; *see also* Francine Ryan, 7 *Key Tech Skills for Law Students*, LAW. MONTHLY (Nov. 27, 2018) https://www.lawyer-monthly.com/2018/11/7-key-tech-skills-for-law-students/ [https://perma.cc/R8ZN-Q4SX].

187. *See* Miller-Kuwana & Ouyang, *supra* note 135.

188. Camille Broussard, Kathleen (Katie) Brown, Daniel Cordova & Sarah Mauldin, *Teaching Legal Technology*, 21 AALL SPECTRUM, Mar.–Apr. 2017, at 22, 24; *see also* Katy (Yin Yee) Ho, *Defining the Contours of an Ethical Duty of Technological Competence*, 30 GEO. J. LEGAL ETHICS 853 (2017); Tad Simons, *For A Lawyer, What Does "Technology Competence" Really Mean?*, THOMSON REUTERS (Apr. 20, 2018),

Judges have noted that technological incompetence can hinder counsel.[189] Associations, such as the American Association of Law Schools and the American Association of Law Libraries, have led panel discussions and created caucuses and subcommittees that would focus on technological competency.[190] Legal tech professionals have questioned how the profession should impose this ethical duty.[191] Attorneys and scholars have started to see the interconnectedness of ethics rules and posited that attorneys must rethink their relationship with technology when delivering legal services.[192] Additionally, it has become apparent that "digital natives" entering the legal world—whether through law school or the workforce—were not inherently legal technology experts; thus, they required further training to be considered technologically competent.[193]

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https://www.thomsonreuters.com/en-us/posts/legal/lawyers-technological-competence/ [https://perma.cc/E7BK-F8DU]; Regina B. Amolsch & Leslie Smith, *Ethics: Keeping Up With Ever Evolving Technology, They Didn't Teach That in Law School*, AM. BAR ASS'N (Oct. 16–18, 2019), https://www.americanbar.org/content/dam/aba/events/franchising/2019_annual_meeting/w24.pdf [https://perma.cc/D7R2-FPW8].

189. Catherine J. Lanctot, *Becoming a Competent 21st Century Legal Ethics Professor: Everything You Always Wanted to Know About Technology (But Were Afraid to Ask)*, 2015 J. PROF. LAW. 83 (citing U.S. Magistrate Judge James C. Francis and U.S. Magistrate Judge John M. Facciola at the 2014 LegalTech New York conference).

190. *E.g.*, Kenneth J. Hirsh, Jean P. O'Grady & Roger Skalbeck, Speakers, & Darin K. Fox, Moderator, Panel Discussion at the Law Libraries and Legal Information 2015 Annual Meeting (Jan. 4, 2015, 4:00 PM), https://memberaccess.aals.org/eWeb//DynamicPage.aspx?webcode=SesDetails&ses_key=3c7b1460-ee96-4362-b0b8-252dfa77ca99 [https://perma.cc/E9EP-JDNP]. The Association of American Law Schools ("AALS") Section on Law Libraries and Legal Information panel consists of academic and law firm librarians. The next year, AALS chartered its Section on Technology, Law, and Legal Education. *Section on Technology, Law & Legal Education*, ASS'N OF AM. LAW SCHS., (Aug. 17, 2016), https://www.aals.org/sections/list/technology-law-and-legal-education/ [https://perma.cc/8ZWY-CH45]. In 2017, AALS created a Teaching Legal Technology Caucus to bring law librarians together who were interested in teaching legal technology in law schools and other settings. *See* Broussard, Brown, Cordova & Mauldin, *supra* note 188, at 24.

191. *See* Ho, *supra* note 188, at 853 ("[I]n exploring the intersection of technology and the law, the issue of *whether* the profession needs a duty of technological competence is increasingly moot. The relevant question to ask should be: '*How* and *to what extent* should an ethical duty of technological competence be imposed?'").

192. Ivy Grey, *How to Meet the Duty of Technology Competence*, L. TECH. TODAY (June 29, 2017), https://www.lawtechnologytoday.org/2017/06/technology-competence/ [https://perma.cc/HGK6-CSBC] ("Based on the interconnectedness of ethics rules, there must be a paradigm shift of our relationship to technology in delivering legal services. Incompetent use of technology when doing legal work is incompetence.").

193. Darth Vaughn & Casey Flaherty, *Tech Comes Naturally to 'Digital Native' Millennials? That's a Myth*, LEGAL REBELS (Oct. 13, 2016), https://www.abajournal.com/legalrebels/article/tech_comes_naturally_to_digital_native_millennials_thats_a_myth [https://perma.cc/KE2M-C3Z3] ("Because they grew up surrounded by technology, the next generation has supposedly acquired all sorts of technological superpowers through osmosis. But getting a Twitter account in utero does not translate into being able to use business technology well. It is akin to expecting the teenager who can microwave a Hot Pocket to be capable of cooking a gourmet meal. They are capable—if they are trained."); *see also* Smathers, *supra* note 14, at 24 (Casey Flaherty Kia Technology Audit).

A. 2017 LEGAL TECHNOLOGY SURVEY

Responding to the industry concerns around legal technology, Katie Brown created a survey in 2017 ("2017 Legal Technology Survey")[194] to answer three main questions: whether legal education institutions incorporated legal technology in their curriculum, who taught these law technology courses, and the topics these courses covered.[195] The survey consisted of ten questions and yielded forty-three complete responses. Questions 1 through 3 asked respondents whether their law school had a dedicated center or institute for legal technology, whether their law school offered an advanced law degree or certificate in technology, and whether there was a specialized technology course in the legal curriculum.[196]

Questions 4 and 8 aimed to dive deeper into formalized, for-credit, standalone legal technology training.[197] Question 4 addressed who taught these courses, and Question 8 identified the legal technology topics covered in these courses.[198] Question 10 focused on legal technology training offered in doctrinal classes.[199]

Conversely, Questions 5 through 7 garnered information about informal legal technology instruction, and Question 9 addressed the legal technology topics discussed in informal technology training settings.[200]

A review of the dataset confirms that legal technology training was gaining momentum in the legal academy. The 2017 Legal Technology Survey data results aligned with the trending emphasis on technology as a recognized skill in the practice of law.[201]

The survey results show five law schools provided intensive legal technology training through a center or institute.[202] One respondent reported that their

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194. A survey can be a powerful instrument for gathering information from large populations, but it may have more value with questions written to address a specific population or need. *See* Jessica de Perio Wittman & Kathleen (Katie) Brown, *Discovering Diamonds in Your Survey Data*, 24 AALL SPECTRUM 20 (2020), https://ssrn.com/abstract=3690120; *infra* Appendix A.

195. *See infra* Appendix A.

196. Combined, these factors were later used to establish the commitment of a law school to incorporating legal technology in its curriculum. *See infra* Appendix A.

197. *See infra* Appendix A.

198. Topics included document assembly and drafting, courtroom technology, decision support systems, ethics of legal technology, legal technology start-ups, code, marketing, matter and knowledge management, new model law firms, online dispute resolutions, project management, software development, legal process engineering, access to justice and legal technology, cloud computing, law firm web development, online marketing, social media and lawyering, and computer security and law practice. Respondents were also given an option to provide topics not originally listed. *See infra* Appendix A.

199. *See infra* Appendix A.

200. Topics included document assembly and drafting, courtroom technology, decision support systems, ethics of legal technology, legal technology start-ups, code, marketing, matter and knowledge management, new model law firms, online dispute resolutions, project management, software development, legal process engineering, access to justice and legal technology, cloud computing, law firm web development, online marketing, social media and lawyering, and computer security and law practice. Respondents were also given an option to provide topics not originally listed. *See* 2017 Legal Technology Survey, *infra* Appendix A.

201. *See supra* Part I.

202. *Infra* Appendix A.

institution offered an LL.M. degree focusing on legal technology.[203] Less than half of the law schools participating in this study offered for-credit technology courses.[204] Results indicated that various types of faculty members provided formal instruction.[205] One respondent indicated that the school's director of information technology taught a for-credit technology class.[206]

Across several law schools, we observed several prominent topics covered in formalized courses: ethics of legal technology, social media and lawyering, computer security and law practice, document assembly and drafting, and finally, courtroom technology. We also generally observed these same trends in the responses regarding informal training.[207]

Topics	Formal Training (Standalone Courses)	Formal Training (Doctrinal Courses)	Informal Training
Ethics of Legal Technology	37.14%	46.88%	22.86%
Social Media and Lawyering	37.14%	34.38%	22.86%
Computer Security and Law Practice	31.43%	28.13%	22.86%
Document Assembly and Drafting	31.43%	18.75%	28.57%
Courtroom Technology	22.86%	31.25%	28.57%

The emphasis on these topics likely reflects the scholarship and writing on legal technology at that time.[208] The diversity of instructors teaching these topics

203. *Infra* Appendix A.

204. *Infra* Appendix A.

205. *Infra* Appendix A (Adjunct Professors (30.77%), Full-time Professors (28.21%), Librarians (faculty) (17.55%), Clinicians (5.13%), and Librarians (non-faculty) (2.56%)).

206. *Infra* Appendix A.

207. *Infra* Appendix A. It should also be noted that more informal technology training was offered in law schools (65.85%) than formal for-credit legal technology or law office technology-type courses (43.90%) in 2017.

208. *See* Broussard, Brown, Cordova & Mauldin, *supra* note 188, at 23. For an argument that legal document proficiency, legal analytics & document integration/brief analysis, e-discovery, law practice technology, and data security are prominent topics that should be taught in Legal Practice/Legal Research and Writing courses, see O'Leary, *supra* note 21, at 197.

likely lent itself to inconsistent content instruction across the curriculum.[209] The data did not offer insight into whether a course spent five minutes or five hours on a particular topic.[210]

Law schools offered informal training during lunch-and-learn sessions ranging from thirty minutes to an hour to encourage student attendance.[211] Some schools offered more workshop-style instruction as a full-day or multi-day event.[212] A few schools offered speaker series and certificate programs that included legal technology instruction.[213] An even wider assortment of instructors taught informal instruction in legal technology.[214]

B. 2020 LEGAL TECHNOLOGY SURVEY

In 2020, Jessica de Perio Wittman joined Brown and distributed another survey ("2020 Legal Technology Survey")[215] to the Law Library Directors' listserv to see if instructional changes had occurred after three years. The 2020 Legal Technology Survey addressed the same questions as the 2017 Legal Technology Survey. All surveys provided a dearth of information on both formal and informal legal technology instruction.[216]

A review of the 2020 dataset confirms that law schools began to offer more standalone technology courses.[217] In those standalone courses, legal technology topics emphasized in the 2017 survey results continued to be popular in 2020.[218] However, there was a decrease in teaching these topics in doctrinal courses.[219] Overall, there was a decrease in teaching technology in informal settings.[220]

The 2020 Legal Technology Survey generated forty-two responses, one less than the 2017 Legal Technology Survey.[221] These figures show a slight increase in law schools providing intensive legal technology training through a center or

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209. *Infra* Appendix A.

210. The survey did not ask how much time was dedicated to each legal topic, but merely whether the topic was introduced or covered in the class.

211. *Infra* Appendix A (lunch and learn sessions: 45.95%).

212. *Infra* Appendix A (workshop-style instruction: 16.22%).

213. *Infra* Appendix A (speaker series (incorporating legal technology instruction): 8.11%; certificate programs (incorporating legal technology instruction): 8.11%) (At the time of the 2017 Legal Technology survey, there were no informal technology certificates being offered by the participating schools.).

214. The assortment included faculty (full-time, adjunct, and clinical), librarians (faculty, non-faculty, and adjunct), information technology staff, student services staff, paraprofessionals, students, individuals or groups affiliated with an undergraduate institution, and outside individuals or organizations who have no instructional status at the law school and were contractually hired to provide training. *Infra* Appendix A.

215. *Infra* Appendix B.

216. "All surveys" refers to the 2017 Legal Technology Survey, *infra* Appendix A, the 2020 Legal Technology Survey, *infra* Appendix B, and the 2021 E-Discovery Course Offering Survey, *infra* Part III.C (data and results on file with authors and the Georgetown Journal of Legal Ethics).

217. *Infra* Appendix B.

218. *Infra* Appendix A; *infra* Appendix B.

219. *Infra* Appendix A; *infra* Appendix B.

220. *Infra* Appendix A; *infra* Appendix B.

221. *Infra* Appendix A; *infra* Appendix B.

institute (seven respondents, up from five in 2017).[222] No respondents in the 2020 Legal Technology Survey said their institutions provided an LL.M. program in legal technology.[223]

More than half of the law schools that responded to the 2020 Legal Technology survey offered for-credit technology courses; the for-credit instruction continues to be offered by a variety of instructors.[224] Librarians now taught most of the for-credit, formalized, standalone legal technology courses offered at law schools.[225]

When comparing the results of the 2017 Legal Technology Survey to those of the 2020 Legal Technology Survey, the data indicate that popular topics previously taught in 2017 continue to be popular in 2020. However, the data indicate that popular topics previously taught in the doctrinal courses[226] decreased uniformly but became the standard when teaching standalone, specialized legal technology courses.

Topics	Standalone Courses		Doctrinal Courses		Informal Training	
	2017	2020	2017	2020	2017	2020
Ethics of Legal Technology	37.14%	44.74%	46.88%	41.18%	22.86%	27.78%
Social Media and Lawyering	37.14%	50.00%	34.38%	20.59%	22.86%	27.78%
Computer Security and Law Practice	31.43%	44.74%	28.13%	14.71%	22.86%	25.00%
Document Assembly and Drafting	31.43%	36.84%	18.75%	17.65%	28.57%	16.67%
Courtroom Technology	22.86%	47.37%	31.25%	17.65%	28.57%	13.89%

222. *Infra* Appendix A; *infra* Appendix B.

223. See *infra* Appendix B for a complete picture of LL.M. offerings in legal technology or technology law.

224. *Infra* Appendix B (Adjunct Professors (28.57%), Full-Time Professors (26.19%), Librarians (faculty) (28.57%), Clinicians (4.76%), Librarians (non-faculty) (7.14%), Librarians (adjunct faculty) (9.52%), and IT Directors (4.76%)).

225. Librarians totaled 45.23% of all instructors teaching these courses. *Infra* Appendix B.

226. *Infra* Appendix A; *infra* Appendix B.

These surveys show that informal training at law schools has decreased since 2017, from 65% to 60%.[227] Law schools continued to undervalue tech training by primarily offering trainings during lunch.[228] Results from 2020 reveal that law schools offered more workshop-style instruction as a full-day or multi-day event.[229] Similarly, more schools offered speaker series that included legal technology instruction.[230] While the number of law schools offering certificate programs incorporating legal technology instruction stayed the same, there was an increase in law schools that now provided an informal technology certificate for their students.[231] Various instructors provided informal instruction.[232] More schools reported that their IT directors and/or IT staff provided informal technology instruction.[233]

The 2020 Legal Technology Survey results also reveal that for-credit legal technology courses covered other "practice-ready" topics.[234] In addition, the results reveal that informal instruction offerings covered many of the same "practice-ready" topics.[235] Interestingly, none of the Survey respondents reported that doctrinal courses included "practice-ready" basics[236] such as Microsoft Word, Microsoft Excel, and cloud computing.[237]

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227. *Infra* Appendix A; *infra* Appendix B.

228. *Infra* Appendix B (lunch and learn sessions: 43.59%). Schools should consider that lunchtime technology training may not be ideal. Students are likely to be distracted or may opt to spend their time elsewhere.

229. *Infra* Appendix A; *infra* Appendix B (workshop-style instruction: 23.08%).

230. *Infra* Appendix A; *infra* Appendix B (speaker series (including legal technology instruction): 28.21%).

231. *Infra* Appendix A (citing that no informal certificates were offered in 2017); *infra* Appendix B (citing that in 2020, 10.26% of schools reported that they offered an informal technology certificate).

232. *Infra* Appendix B (full-time faculty (37.50%), adjunct faculty (25.00%), and clinical faculty (20.00%) offering informal technology instruction, librarians with non-faculty (15.00%), faculty (37.50%), or adjunct faculty (7.50%) status).

233. *Infra* Appendix B (IT director (15.00%) offering informal legal technology instruction; IT staff (15.00%) offering informal technology instruction).

234. *Infra* Appendix B (These topics included Matter and Knowledge Management (31.58%), New Model Law Firms (26.32%), Project Management (28.95%), Microsoft Word (39.47%), Microsoft Excel (36.84%), Presentation Technology (31.58%), and Cloud Computing (36.84%).).

235. For example, topics covered in these courses were Microsoft Word (38.89%), Microsoft Excel (33.33%), and Matter and Knowledge Management (22.22%).

236. *Infra Appendix B*. For lawyers, Microsoft Office is as close to a must-have piece of technology as there is. Some of the applications it contains, namely MS Word, are inescapably necessary for a modern lawyer to be familiar with. *Types of Legal Tech for Your Firm*, LAWYERIST, https://lawyerist.com/technology/microsoft-office/ [https://perma.cc/PP87-MDDL] (last visited Mar. 14, 2022). According to the 2019 Gartner Market report, 87% of all U.S. companies use the Microsoft Office Suite. PROCERTAS, https://www.procertas.com/ [https://perma.cc/RV8M-PGQ4] (last visited Mar. 14, 2022). Additionally, ABA Formal Opinion 477R highlights cloud computing and alternative data storage as a technology competency topic. ABA Comm. on Ethics and Prof'l Responsibility, Formal Op. 477R (2017).

237. However, 5.88% of respondents reported that presentation technology was taught in doctrinal courses. *Infra* Appendix B.

Topics	Formal Training (Standalone Courses)	Formal Training (Doctrinal Courses)	Informal Training
Matter and Knowledge Management	31.58%	11.76%	22.22%
New Model Law Firms	26.32%	5.88%	5.56%
Project Management	28.95%	8.82%	11.11%
Microsoft Word	39.47%	0%	38.89%
Microsoft Excel	36.84%	0%	33.33%
Presentation Technology	31.58%	5.88%	11.11%
Cloud Computing	36.84%	0%	5.56%

C. 2021 E-DISCOVERY SURVEY

By 2021, e-discovery for litigation was common practice.[238] In turn, we were interested to see if e-discovery was a standard topic taught in the legal curriculum —either as a standalone course, part of another course, or both—and who taught those courses. We sent a short, three-question survey ("2021 E-Discovery Course Offering Survey") inquiring about e-discovery instruction to gather this information. Results demonstrated that 81.63% of law schools taught e-discovery over the past five years.[239] Like for-credit legal technology classes, a mix of faculty, adjunct faculty, and all statuses of law librarians (faculty, adjunct faculty, non-faculty) offered e-discovery instruction at law schools.[240]

238. *See generally* Marc Fulkert, *Using eLitigation Tools to Advance Your Case*, 69 DOJ J. FED. L. & PRAC., July 2021, at 13; Robert C. Manlowe, Andrija Samardzich & Gregory D. Shelton, *Paradigm Shifts in e-Discovery Litigation: Cooperate or Continue to Pay Dearly*, 78 DEF. COUNSEL J. 170 (2011); Peter J. Corcoran, III, *Strategies to Save Resources and Reduce E-Discovery Costs in Patent Litigation*, 21 TEX. INTELL. PROP. L.J. 103 (2013).

239. In addition, 57.14% of respondents reported that e-discovery instruction occurred in standalone classes, 32.65% reported that another course incorporated e-discovery into its curriculum, and 8.16% of respondents taught e-discovery as a standalone course and a topic in another course. 2021 E-Discovery Course Offering Survey, Part III.C.

240. *See id.* (Faculty (24.52%), Adjunct Faculty (44.93%), Clinical Faculty (0%) Law Librarians (faculty) (18.16%), Law Librarians (adjunct faculty) (6.12%), Law Librarians (non-faculty) (6.12%), IT Directors and/or IT Staff (0%); other guest lecturer (4.08%)).

E-Discovery Course Offerings at Law Schools (2016-2021)		
Standalone Classes	Topic in Another Course	Both
57.14%	32.65%	8.16%

D. TRENDS IN SURVEY DATA AFTER CODING TO THE LEGAL SERVICES INNOVATION INDEX

As discussed in Part I, all modern models of lawyering competency stress technological literacy. The data reveal that traditional technology or technology-related topics[241] increased between 2017 and 2020 in standalone courses. Therefore, we inferred that these areas were now routinely covered in the technology course curriculum.[242] However, the results of the 2017 and 2020 surveys demonstrate a decrease in the same legal technology topics in doctrinal courses.[243] The data also reveals that practice-centric technology or technology-related topics[244] generally decreased over the three years.[245] Our findings built on the work completed by Daniel Linna, Jr., and Jordan Galvin. We analyzed our survey results from the 2017 and 2020 Legal Technology Surveys with the prototype disciplines first listed in the Legal Services Innovation Index.[246]

241. These topics include courtroom technology, project management, social media and lawyering, computer security and law practice, document assembly and drafting, matter and knowledge management, and cloud computing.

242. Data results show an increase in the following areas: courtroom technology, project management, social media and lawyering, computer security and law practice, document assembly and drafting, matter and knowledge management, and cloud computing. *Infra* Appendix A; *infra* Appendix B; *see also* de Perio Wittman & Brown, *supra* note 115. Additionally, there was an increase in e-discovery offerings at law schools. *See* 2021 E-Discovery Course Offering Survey, *supra* Part III.C.

243. These topics include courtroom technology, project management, social media and lawyering, computer security and law practice, document assembly and drafting, matter and knowledge management, and cloud computing.

244. These topics include online dispute resolution, web development, legal process engineering, software development, legal technology startups, access to justice and legal technology, and decision support systems.

245. Data results generally show a decrease in the following areas: online dispute resolution (standalone: −.68%, doctrinal: +4.96%, informal: −2.93%); web development (standalone: −1.81%, doctrinal: −12.50%, informal: +2.62%); legal process engineering (standalone: -9.03%, doctrinal: −3.31%, informal: −2.86%); software development (standalone: −6.40%, doctrinal: −3.31%, informal: −2.93%); access to justice and legal technology (standalone: −5.11%, doctrinal: +5.15%, informal: −8.89%); and decision support systems (standalone: 3.76%, doctrinal: −3.31, informal: +2.78%). *Infra* Appendix A; *infra* Appendix B; *see also* de Perio Wittman & Brown, *supra* note 115.

246. The prototype disciplines included in the Law School Innovation Index are Business of Law, Innovative/Entrepreneurial Lawyering, Applied Technology, Leadership for Lawyers, Technology Basics, Empirical Methods, Data Analytics, Process Improvement, Computational Law, and Project Management. Linna, *supra* note 29.

Linna and Galvin's Legal Services Innovation Index reviewed law firm and law school websites to identify the value of innovation by cataloging legal-service delivery innovations and prototype disciplines.[247] The Legal Services Innovation Index was intended to help law schools better understand the evolution of the legal landscape, which would help them prepare their students for the future.[248]

Topics	Standalone Courses	Doctrinal Courses
	Rate of Change	Rate of Change
Ethics of Legal Technology	+7.6%	−5.70%
Social Media and Lawyering	+12.86%	−13.79%
Computer Security and Law Practice	+13.31%	−13.42%
Document Assembly and Drafting	+5.41%	−1.10%
Courtroom Technology	+24.51%	−13.60%
Project Management	+11.81	+2.57%
Cloud Computing	+11.13	−15.63%
Matter and Knowledge Management	+8.72	−10.12%

Legal process engineering and software development instruction generally decreased in standalone technology courses, doctrinal courses, and informal training in law schools participating in the 2017 and 2020 Legal Technology Surveys.[249]

247. Linna and Galvin's study covered the following innovation categories: alternative fees, project management, process improvement and innovation framework, knowledge management, automation basics, data analytics, artificial intelligence, legal operations, proactive law, and blockchain. *Id.* In this prototype, Linna and Galvin measured ten different legal service-delivery disciplines: Business of Law, Innovative/Entrepreneurial Lawyering, Applied Technology, Leadership for Lawyers, Technology Basics, Empirical Methods, Data Analytics, Process Improvement, Computational Law, and Project Management. *Id.*

248. *Id.*

249. *Infra* Appendix A; *infra* Appendix B; *see also* de Perio Wittman & Brown, *supra* note 194.

Topics	Standalone Courses		Doctrinal Courses		Informal Training	
	2017	2020	2017	2020	2017	2020
Online Dispute Resolution	8.57%	7.89%	15.63%	20.59%	5.71%	2.78%
Law Firm Web Development	22.86%	21.05%	12.50%	0%	5.71%	8.33%
Legal Process Engineering	14.29%	5.26%	6.25%	2.94%	2.86%	0%
Software Development	14.29%	7.89%	6.25%	2.94%	5.71%	2.78%
Access to Justice	31.43%	26.32%	12.50%	17.65%	20.00%	11.11%
Decision Support Systems	14.29%	10.53%	6.25%	2.94%	0%	2.78%
Process Improvement	–	0%	–	2.94%	–	0%

E. 2021 LAW SCHOOL WEBSITE DATA MINING PROJECT

To supplement the 2017 and 2020 Legal Technology Surveys and the 2021 E-Discovery Course Offering Survey, we curated data from the law school websites of all ABA-accredited law schools ("2021 Law School Website Data Mining Project") with Linna and Galvin's ten legal-service delivery disciplines in mind.[250] The law school websites were mined for data to identify whether there

250. Student research assistants mined the websites of all ABA-accredited law schools from a consumer perspective with Linna and Galvin's legal-service delivery disciplines in mind. *See* Linna, *supra* note 29. The 2017 Legal Technology Survey, the 2020 Legal Technology Survey, and the 2021 E-Discovery Course Offering Survey, combined with the methodologies described in this section [hereinafter 2021 Law School Website Data Mining Project], serve as a longitudinal study. 2021 Law School Website Data Mining Project (data and results on file with the Georgetown Journal of Legal Ethics); *see* de Perio Wittman & Brown, *supra* note 194 (discussing that longitudinal studies collect data to make inferences about a sample population over time and that the key to longitudinal studies is surveying the same sample population). We coded the law school courses identified by the students using the definitions and prototype disciplines in the Legal Services Innovation Index. The categories are alternative fees; artificial intelligence; blockchain and cryptocurrency; contract management; cybersecurity; data analytics; data privacy and protection; document assembly; electronic discovery; expert systems; incubator; information management; innovation entity; knowledge management; process improvement; project management; cloud and alternative data storage; electronic communication, wireless internet, and passwords; and virtual private networks. 2021 Law School Website Data Mining Project, *supra*.

were dedicated technology centers or clinics, certificate offerings, and advanced degree offerings in technology at the LL.M., Masters, and S.J.D./J.S.D. levels.[251]

We also gathered data on technology, legal technology, and courses in the legal technology space at ABA-accredited law schools.[252] Then, we coded[253] these course offerings using the protocols highlighted in the Legal Services Innovation Index.[254] The surveys we conducted suggest that law schools generally do not place their core curricular priorities in legal technology instruction when constructing the academic curriculum unless historically identified by legal scholarship and the ABA Formal Opinions as important.[255]

We completed data mining throughout the 2021 calendar year. When reviewing the 2021 Law School Website Data Mining Project results, we observed that eight schools have committed to teaching technology and technology competency at their institutions (the "100% committers").[256] These schools qualified for this designation because they have intensive legal technology programs that include legal technology classes, centers or clinics,[257] specializations, and advanced degrees at the Masters, LL.M, and S.J.D./J.S.D. levels.[258] This subset of schools introduces graduates into the legal profession who have acquired a wealth of technology skills. Based on the 2021 Law School Website Data Mining

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251. 2021 Law School Website Data Mining Project, *supra* note 250.

252. We curated course data by mining information from law school websites, course catalogs, publicly available online syllabi, a syllabus database maintained by the Center for Computer Assisted Legal Instruction ("CALI"), and direct contact with law school representatives. Research assistants made direct contact with law school employees in the Admissions department to inquire about available courses.

253. For a discussion on the importance of coding qualitative data, see de Perio Wittman & Brown, *supra* note 194.

254. *See* 2021 Law School Website Data Mining Project *supra* note 250.

255. Volini, *supra* note 133; *supra* notes 56–59 and accompanying text (discussing ABA formal opinions); *see* O'Leary, *supra* note 21.

256. 2021 Law School Website Data Mining Project, *supra* note 250. We are coining the term "100% committers." We recognize that there may be more 100% committers among the 199 ABA-accredited law schools and the data publicly available on a law school's website may not reflect their technology commitment. For example, many law schools invest in technology tools, training, and equipment. But law schools that fall under the "100% committers" designation offer a J.D. with a specialization in technology, an advanced degree (at the LL.M, Masters, or S.J.D./J.S.D. levels), and have a center or clinic devoted to technology. This metric also includes one school that does not have any of these criteria but has a legal technology class that is a required course for the J.D. curriculum.

257. Established law and tech center and initiative directors hosted a session in May 2021. *See Creating, Building, and Growing Law and Technology Centers: The Why, The What, and the How*, ASS'N OF AM. L. SCHS. (May 19, 2021), https://www.aals.org/sections/list/technology-law-and-legal-education/creating-building-and-growing-law-and-technology-centers-the-why-the-what-the-how/ [https://perma.cc/AC5S-9R6G].

258. 2021 Law School Website Data Mining Project, *supra* note 250. Current data shows that the following schools qualify under the "100% committers" category: American University Washington College of Law, UC Berkeley School of Law, Chicago-Kent College of Law, Colorado, Loyola-Los Angeles, Northwestern, Suffolk, and the University of North Texas. The University of North Texas is the only ABA-accredited school that requires completion of a Practice-Related Technology requirement for all J.D. candidates. If we expanded the definition of "100% committers" to include certificate programs, only 4 law schools would qualify under this category.

Project results, we concluded that only 4% of all ABA-accredited law schools are fully committed to teaching technology competency in the legal profession.[259]

Programs Offered at ABA Accredited Law Schools	Percentage
J.D. specializing in technology	22.5%
Masters, LL.M, or S.J.D./J.S.D.	22.5%
Center or clinic focusing on technology	19%
Technology or technology-related certification	19%

The 2021 Law School Website Data Mining Project also uncovered that 97.9% of law schools offered courses in the technology and legal technology space.[260] Of all of the ABA-accredited schools, 670 courses were offered at the time of the data curation.[261] We coded the course offerings using the protocols from Linna and Galvin's Law Firm Innovation Index[262] and further sorted them into two categories: general technology courses and legal technology courses.[263] Of the 670 courses, general technology topics were covered 654 times, and legal technology topics were covered 390 times.[264]

259. 2021 Law School Website Data Mining Project, *supra* note 250.

260. *Id.*

261. *See supra* note 252. Six hundred and seventy courses sound like a large number of courses in the technology space. Assuming there are no 100% committers, this means that there is an average of 3.38 technology courses at each of the 199 ABA-accredited law schools. We also recognize that course data publicly available on a law school's website is subject to change on a semester-to-semester basis. The different types of law school website architecture also made information difficult to find. Additionally, there may be a discrepancy between what a law school course description states and what is being taught in the course. For example, it is unclear whether five minutes or an entire class is dedicated to that one topic.

262. We coded this data set using the following protocols from Linna and Galvin's Legal Services Innovation Index: alternative fees, artificial intelligence, blockchain and cryptocurrency, contract management, cybersecurity, data analytics, data privacy and protection, document assembly, electronic discovery, expert systems, incubator, information management, innovation entity, knowledge management, process improvement, project management, cloud and alternative data storage, electronic communication, wireless internet and passwords, and virtual private networks. Linna, *supra* note 29. For further discussion on coding qualitative and quantitative data, see de Perio Wittman & Brown, *supra* note 194.

263. 2021 Law School Website Data Mining Project, *supra* note 250. The following codes were categorized as general technology: Artificial Intelligence; Blockchain and Cryptocurrency; Data Analytics; Information Management; Knowledge Management; Process Improvement; Project Management; Cloud and Alternative Data Storage; Electronic Communication, Wireless Internet, Passwords; Virtual Private Networks; Cybersecurity. The following codes were categorized as legal technology: Alternative Fees, Contract Management, Document Assembly, Expert Systems, Incubator, Innovation Entity, Data Privacy and Protection, E-Discovery.

264. 2021 Law School Website Data Mining Project, *supra* note 250.

Category	Number
General Technology	
Artificial Intelligence	96
Blockchain and Cryptocurrency	69
Data Analytics	59
Information Management	22
Knowledge Management	23
Process Improvement	46
Project Management	26
Cloud and Alternative Data Storage	29
Electronic Communication, Wireless Internet, Passwords	74
Virtual Private Networks	13
Cybersecurity	197
Legal Technology	
Alternative Fees	7
Contract Management	16
Document Assembly	36
Expert Systems	11
Incubator	5
Innovation Entity	36
Data Privacy and Protection	143
E-Discovery	136

When analyzing the course data, we observed that law schools tend to offer courses specializing in the following areas: (1) cybersecurity and data privacy, (2) artificial intelligence, (3) technology in law practice, and (4) electronic discovery.[265] Based on this data, technology courses, legal technology courses, or courses in the legal technology space continue to cover traditional technology and technology-related topics rather than the practical use of technology.[266]

Further analysis indicates that technology courses, legal technology courses, or courses in the legal technology space inconsistently cover practice-centric technology or technology-related topics.[267]

Practice-Centric Topics	Percentage of Courses
Data Analytics	8.80%
Document Assembly	5.37%
Information Management	3.28%
Data Privacy and Protection	21.34%
Cybersecurity	29.40%
E-Discovery	20.29%

IV. POTENTIAL SOLUTIONS

Historically, law schools have not modified their pedagogy unless prompted by a state bar association or if there is a change to the ABA Standards on Legal Education.[268] This conservative approach to curricular reform needs to change.[269]

265. For purposes of this study, we initially observed that an overwhelming majority of law schools offer intellectual property courses. We recognize some intellectual property courses may include technology topics. However, reporting a standalone intellectual property course as a "technology" or "legal technology" course would inflate overall technology course results. Similarly, we recognize that reporting a standalone intellectual property specialization would also inflate overall results.

266. The number of courses offered on these topics (based on course name) are as follows: courtroom technology (16), project management (26), social media and lawyering (4), computer security and law practice (338), document assembly and drafting (36), matter and knowledge management (23), and cloud computing (29). 2021 Law School Website Data Mining Project, *supra* note 250.

267. The number of courses offered on these topics (based on course name) are as follows: online dispute resolution (0), web development (8), legal process engineering (4), software development (4), legal technology startups (3), access to justice and legal technology (6), and decision support systems (0). *Id.*

268. *See supra* Part I; *supra* Part II.

269. See Steven C. Bennett, *When Will Law School Change?*, 89 NEB. L. REV. 87, 104 (2010), for a discussion of how "elite" institutions are conservative in their curricular reform and how law schools are reluctant to make any curricular change until "elite" institutions take the lead.

In this section, we recommend solutions for addressing technology training in legal education.

A. THE IMPACT OF THE AMERICAN BAR ASSOCIATION, STATE COURTS, AND STATE BAR ASSOCIATIONS

Law school's primary purpose is to graduate future lawyers.[270] In some ways, legal education has been the same since Christopher Langdell first began teaching the case method at Harvard in the nineteenth century.[271] But there is also a strong history of legal education making changes to the curriculum in response to external reviews and rule changes promulgated by the ABA.[272]

The Carnegie Report, issued in 2007, is the most recent example of an independent external review of law school teaching and practice. The report compared legal education practices with other professional educational training programs.[273] It raised a concern that legal education may produce lawyers who lack a commitment to professional responsibility and recommended imparting basic skills to lawyers before entering the profession.[274] More specifically, the Carnegie Report recommended the expansion of the "existing common core of legal education . . . to provide students substantial experience with practice as well as opportunities to wrestle with the issues of professionalism."[275]

Since the Carnegie Report, legal education institutions have made instructional changes in some areas. Schools have moved away from solely relying on the case method approach in their instruction and added more practice-based skills and

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270. *Id*. at 90.

271. *See* Weaver, *supra* note 99.

272. For further discussion of the McCrate Report, see Amy B. Cohen, *The Dangers of the Ivory Tower: The Obligation of Law Professors to Engage in the Practice of Law*, 50 LOY. L. REV. 623 (2004); Russle Engler, *The MacCrate Report Turns 10: Assessing Its Impact and Identifying Gaps We Should Seek to Narrow*, 8 CLINICAL L. REV. 109 (2001). See also the CARNEGIE REPORT, discussed *infra* notes 273–75, 277.

273. For a full analysis of the history of legal education and the creation of the Carnegie Report, see John O. Sonsteng, Donna Ward, Colleen Bruce & Michael Petersen, *A Legal Education Renaissance: A Practical Approach for the Twenty-First Century*, 34 WM. MITCHELL L. REV. 303 (2007). Also, see generally WILLIAM M. SULLIVAN, ANNE COLBY, JUDITH WELCH WEGNER, LLOYD BOND & LEE S. SHULMAN, EDUCATING LAWYERS: PREPARATION FOR THE PROFESSION OF LAW (2007), http://archive.carnegiefoundation.org/publications/pdfs/elibrary/elibrary_pdf_632.pdf [https://perma.cc/UP8Z-GSXE] [hereinafter CARNEGIE REPORT]; Nelson P. Miller, *An Apprenticeship of Professional Identity: A Paradigm for Educating Lawyers*, MICH. BAR J., Jan. 2008, at 20.

274. See Bennett, *supra* note 269, for a discussion of Carnegie Report commentary and how professional responsibility is often only one class in law school taken in the third year by most students to meet a graduation requirement. See also William M. Sullivan, *After Ten Years: The Carnegie Report and Contemporary Legal Education*, 14 U. ST. THOMAS L.J. 331, 335 (2018), for the finding that

> The case-dialogue method possessed several strengths but also generated unintended consequences of excessive reliance on this one form of teaching, specifically the failure to provide systematic and effective training in the full range of capacities needed for legal practice, and neglect of effective support for developing the ethical and contextual dispositions essential to professional identity.

275. CARNEGIE REPORT, *supra* note 273, at 9.

experiential learning.[276] It is debatable whether the catalyst for instructional change was spurred by the Carnegie Report[277] or by additions and changes to the ABA Standards.[278]

In this article, we have argued that the existing common core of legal education should include legal technology training. Until the ABA moves away from purposely using vague language,[279] it is the states' responsibility to refine the definition of technology competence. This includes providing clear language on the expectations of technology competence, identifying a base curriculum that is required of all attorneys in that jurisdiction, and offering adequate training in the form of CLEs to emphasize the importance of specific technology topics.

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276. *See generally* A. Benjamin Spencer, *The Law School Critique in Historical Perspective*, 69 WASH. & LEE L. REV. 1949 (2012).

277. Bennett, *supra* note 269 ("[F]or all its careful preparation and comprehensive scope, the 2007 Carnegie Report has encountered 'widespread indifference' within the legal academy.").

278. *See* ABA STANDARDS, *supra* note 20, at Standard 304 ("EXPERIENTIAL COURSES: SIMULATION COURSES, LAW CLINICS, AND FIELD PLACEMENTS (a) Experiential courses satisfying Standard 303(a) are simulation courses, law clinics, and field placements that must be primarily experiential in nature and must: (1) integrate doctrine, theory, skills, and legal ethics, and engage students in performance of one or more of the professional skills identified in Standard 302; (2) develop the concepts underlying the professional skills being taught; (3) provide multiple opportunities for performance; (4) provide opportunities for student performance, self-evaluation, and feedback from a faculty member, or, for a field placement, a site supervisor; (5) provide a classroom instructional component; or, for a field placement, a classroom instructional component, regularly scheduled tutorials, or other means of ongoing, contemporaneous, faculty-guided reflection; and (6) provide direct supervision of the student's performance by the faculty member; or, for a field placement, provide direct supervision of the student's performance by a faculty member or a site supervisor. (b) A simulation course provides substantial experience not involving an actual client, that is reasonably similar to the experience of a lawyer advising or representing a client or engaging in other lawyering tasks in a set of facts and circumstances devised or adopted by a faculty member. (c) A law clinic provides substantial lawyering experience that involves advising or representing one or more actual clients or serving as a third-party neutral. (d) A field placement course provides substantial lawyering experience that (1) is reasonably similar to the experience of a lawyer advising or representing a client or engaging in other lawyering tasks in a setting outside a law clinic under the supervision of a licensed attorney or an individual otherwise qualified to supervise, and (2) includes the following: (i) a written understanding among the student, faculty member, and a person in authority at the field placement that describes both (A) the substantial lawyering experience and opportunities for performance, feedback and self-evaluation; and (B) the respective roles of faculty and any site supervisor in supervising the student and in assuring the educational quality of the experience for the student, including a clearly articulated method of evaluating the student's academic performance; (ii) a method for selecting, training, evaluating and communicating with site supervisors, including regular contact between the faculty and site supervisors through in-person visits or other methods of communication that will assure the quality of the student educational experience. When appropriate, a school may use faculty members from other law schools to supervise or assist in the supervision or review of a field placement program; (iii) evaluation of each student's educational achievement by a faculty member; and (iv) sufficient control of the student experience to ensure that the requirements of the Standard are met. The law school must maintain records to document the steps taken to ensure compliance with the Standard, which shall include, but is not necessarily limited to, the written understandings described in Standard 304(d)(i). (e) Credit granted for such a simulation, law clinic, or field placement course shall be commensurate with the time and effort required and the anticipated quality of the educational experience of the student. (f) Each student in such a simulation, law clinic, or field placement course shall have successfully completed sufficient prerequisites or shall receive sufficient contemporaneous training to assure the quality of the student educational experience.").

279. *See supra* Part I.

B. ONCE A BASE CURRICULUM IS ESTABLISHED, LAW SCHOOLS CAN IMPLEMENT UNIFORM TECHNOLOGY TRAINING IN THEIR JURISDICTION

Once a state provides clear language on technology competence and establishes a base curriculum for all attorneys, law schools will be able to implement standardized technology training that will contribute to a rigorous program of legal education.[280]

Today, law schools are still generally structured to produce traditional lawyers.[281] They teach students to "think like a lawyer" in the first year of law school and re-emphasize the same skills for two (or three) more years.[282] Law schools continue to accept and graduate students at record numbers with an exclusively legal-thinking approach by perpetuating a model that does not emphasize practice-based training.[283]

Once a state provides clear definitions and curricular expectations in technology for practicing attorneys, law schools can take action. This will create an opportunity to incorporate specific training in the law school curriculum that meets the standards for technology competence in that jurisdiction. Law schools will then move away from training students with a traditionalist approach and move toward a Whole Lawyer model that emphasizes tech savviness and technology integration in its foundations.[284]

1. OPTION 1: ALL SCHOOLS SHOULD STRIVE TO BE 100% COMMITTERS

A few law schools have fully incorporated training opportunities into their curriculum by supplementing their J.D. program with technology specializations, centers and clinics, and advanced degrees. This curricular approach acknowledges the Whole Lawyer model as law firms and legal departments hire holistic problem solvers who know how and when to leverage technology.[285] Since

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280. *See* ABA STANDARDS, *supra* note 20, at Standard 301(a).

281. *See* Smathers, *supra* note 14, at 32; *see also* Michael Kelly, *A Gaping Hole in American Legal Education*, 70 MD. L. REV. 440, 446 ("The 'gaping hole' . . . refers to the way that law schools fail systematically to address the dominant role that organizations now play in the legal profession. Negotiating organizational life in the law is now an important element of a successful career in the profession—a lesson recently learned by partners jettisoned from firms, and by lawyers categorized as nonequity partners, of counsel, staff, permanent associates, or underperforming partners.").

282. *See* Smathers, *supra* note 14, at 32.

283. *See generally ABA Required Disclosures*, AM. BAR ASS'N (2021), https://www.americanbar.org/groups/legal_education/resources/statistics/ [https://perma.cc/Q9W3-LQPV] (reporting on enrollment and graduation rates at ABA-accredited law schools); *see also supra* Part I (discussing the lawyering competency model of the I-shaped attorney); Miller-Kuwana & Ouyang, *supra* note 135 ("New attorneys were rated lowest (combining slightly weak, weak, or very weak ratings) in leadership skills (65%) and client interactions (64%) by more than half of practicing attorney respondents. Networking, decision-making, judgment, and time management skills fared slightly better, but respondents reported room for improvement.").

284. *See supra* Part I.D.5 and notes 119–22.

285. de Perio Wittman & Brown, *supra* note 115, at 03:17 (citing Rhys Dipshan, *Tech Competency for Tomorrow's Lawyers Is About More Than Just Tech Proficiency*, LEGALTECH NEWS (Aug. 31, 2020) (available through LEXIS and Bloomberg Law)); *see supra* Part I.D.5 and notes 119–22.

technology training is embedded throughout the curriculum, these institutions increase the likelihood of creating Whole Lawyers that can take on new, significant roles and responsibilities in legal practice.[286] Schools that have adopted the 100% committer approach have invested substantial financial resources to ensure success. This results in a commitment to hiring tech-savvy faculty and staff,[287] building enhanced classrooms and facilities,[288] and offering technology-driven training and services.[289] Despite the financial investment necessary to do so, all schools should strive to be 100% committers.[290]

2. OPTION 2: SCHOOLS SHOULD ADOPT A ROBUST PRACTICE-RELATED TECHNOLOGY REQUIREMENT

The University of North Texas is the only ABA-accredited law school that currently requires completion of a Practice-Related Technology requirement for all J.D. candidates.[291] However, the Practice-Related Technology requirement is fulfilled by taking a one-credit course on a pass/fail basis. If schools opt to incorporate a Practice-Related Technology requirement in their curriculum and are committed to the Whole Lawyer model, we recommend offering a mandatory course that mirrors the credit requirements and time commitment set aside for legal research and writing courses in the first year at many ABA-accredited law schools. [292] Legal research and writing are fundamental skills required of all attorneys today, and law schools have changed their curricula to recognize the importance of these skills.[293] As technology is central to the foundations of the Whole Lawyer, law schools must emphasize technology competency as a fundamental

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286. *See* O'Leary, *supra* note 21, at 207–08 (first citing GEO. L. CTR. ON ETHICS & THE LEGAL PRO., THOMSON REUTERS LEGAL EXEC. INST. & PEER MONITOR, *supra* note 125, at 15; then citing Packel, *supra* note 125; and then citing Skolnik, *supra* note 125).

287. For example, law schools can recruit multiple faculty members who specialize in technology and develop robust IT departments.

288. For example, law schools can invest funding to enhance their classrooms with state-of-the art technology.

289. For example, large touchscreen monitors can integrate with the student administration system and the academic calendar.

290. For example, North Carolina Central University recently acquired grant funding that is specifically earmarked for developing a Tech Law and Policy Center. This investment will likely make NCCU a 100% committer. Ayana Hernandez, *Intel Pledges $5 Million to Develop Tech Law and Policy Center at HBCU North Carolina Central University*, N.C. CENT. UNIV. (Feb. 17, 2021, 8:05 AM) https://www.nccu.edu/news/intel-pledges-5-million-develop-tech-law-and-policy-center-hbcu-north-carolina-central [https://perma.cc/5A68-DX2H].

291. *See* 2021 Law School Website Data Mining Project, *supra* note 250.

292. Most ABA-accredited law schools offer legal research and writing in the first year of the J.D. curriculum. Seattle University School of Law offers a two-year immersive program in legal research and writing for its J.D. students. Advanced Legal Research classes are offered in several ABA-accreditation law schools during students' second and third years in recognition that the first-year legal research curriculum is foundational in nature.

293. Lucia A. Silecchia, *Legal Skills Training in the First Year of Law School: Research? Writing? Analysis? Or More?*, 100 DICK. L. REV. 245, 249 (1996).

skill worthy of the same amount of time and resources as legal research and writing.[294]

3. OPTION 3: SCHOOLS SHOULD ADOPT A UNIVERSAL DESIGN APPROACH AND FULLY INTEGRATE TECHNOLOGY TRAINING INTO THE ENTIRE CURRICULUM

Even if schools offer a Practice-Related Technology requirement, these courses may not adequately provide students access to all of the technology and skills necessary for modern-day practice.[295] Survey data show doctrinal classes do not typically cover, provide students access to, or emphasize practice-centric technology skills.[296] Instead, clinical and lawyering skills courses, available to students in their second and third years as law students, address technology in some of the expected proficiencies highlighted in the Delta, O-shaped, and Whole Lawyer models, including communication, drafting, and advocacy.[297]

We recommend that law schools be required to conduct a technology-based lawyering skills assessment across the curriculum. This inventory will enable law schools to identify where gaps in technology skills exist and incorporate technology training into every part of the curriculum. For example, e-discovery technology and training can be incorporated into first-year Civil Procedure courses.[298] Students can learn how to calculate the present value of a structured settlement offer and the expected value of a tort claim using spreadsheets in their first-year torts class.[299] Drafting technology and training can be offered in first-year contracts courses.[300] Cybersecurity technology and training can be incorporated into any course that emphasizes the need to protect confidential, personally identifiable, or

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294. *See id*. at 274.

295. We recognize that technological investment at law schools is mostly budget-driven. If practice-centric technology skills, such as document automation, process design, case management systems, e-discovery, and cybersecurity were prioritized in the curriculum in the same way law firms prioritized overhead technology investments, it would be quite easy to teach these skills and supply access to tools, as the academic curricula set by the 100% committers identified in this article demonstrate.

296. Survey results did not indicate the amount of time dedicated to a specific technology or technology-related topic.

297. Depending on the law school, clinical courses are not the only way students can fulfill the experiential learning requirement set by the ABA.

298. For example, Joseph Custer teaches an e-discovery component in every civil procedure class at Case Western Reserve University School of Law. *2022 Preconference Teaching Technology Workshop*, AM. ASS'N OF L. LIBS. (2022), https://www.aallnet.org/conference/agenda/workshops/ [https://perma.cc/69LQ-LSFE] (last visited Oct. 21, 2022).

299. Sachin Pandya at the University of Connecticut School of Law assigns 1L Tort students to use spreadsheet software to help them calculate (1) the present value of a structured settlement offer and (2) the expected value of a tort claim. Pandya first provides them with worked-out examples in a handout and accompanying . xlsx file, then asks them to complete ungraded online quizzes (via Blackboard) consisting of short vignettes that require them to make these calculations, given the information provided. E-mail from Sachin S. Pandya, Professor of Law, Univ. of Conn., to Jessica de Perio Wittman, Director of the Law Library, Associate Professor of Law, Univ. of Conn. (July 25, 2022) (on file with authors).

300. Brown offers drafting technology and training in first-year courses at Charleston School of Law.

any other private information.[301] Lean Six Sigma, Agile, and other process optimization techniques can be incorporated in any course that discusses legal practice.[302] Social media as government records can be discussed in legal research classes and administrative law courses.[303] Data analytics and competitive intelligence technology and training can be offered in courses that address litigation and legal research.[304]

4. OPTION 4: SCHOOLS SHOULD CREATE IMMERSIVE ENVIRONMENTS WITH INCREASED EXPOSURE TO TECHNOLOGY IN SPACES, SERVICES, AND SCHOLARLY DISCOURSE

Even when law schools create an expectation that law students will make technology a part of their educational experience, they often put limitations on what that experience entails.[305] For example, many faculty still consider banning technology in the classroom.[306] Law school deans today must decide where to allocate their limited budgets, and technology facilities and services may not be identified as priorities.[307] As a result, law school spending practices and classroom policies send a mixed message to students about the role of technology in their lives as modern lawyers.[308]

Some law schools have opted to prioritize technology spending. In Fall 2014, the University of Oklahoma College of Law launched a college-wide Digital Initiative, incorporating iPad technology, training from outside vendors[309] and potential employers, and redesigned facilities that incorporate the collaborative use of technology in modern law practice.[310] Law schools not ready to make a

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301. de Perio Wittman offers cybersecurity training as a guest speaker in several upper-level seminar classes at the University of Connecticut School of Law.

302. Jessica de Perio Wittman & Kathleen (Katie) Brown, *A Comparative Study on Process Optimization and the Modern Law Library's Involvement in Achieving Efficiency at the Law School in Times of Change*, 39 LEGAL REFERENCE SERV. Q. 170 (2020); *see* Lourdes M. Fuentes Slater, *Legal Process Improvement Through Lean: Bringing the Best of Business to the World of Law*, PEER TO PEER: ILTA'S Q. MAG., Spring 2019, at 32–33.

303. *See generally* Jessica de Perio Wittman, *A Trend You Can't Ignore: Social Media as Government Records and Its Impact on the Interpretation of the Law*, 31 ALB. L.J. SCI. & TECH. 53 (2021).

304. Both authors offer data analytics and competitive intelligence technology and training in litigation-related and research courses.

305. Murray, *supra* note 24, at 226 ("Law schools have high expectations about how student-driven technologies can and should support student learning.").

306. *See id.*

307. For a further discussion on this topic, see Patrick J. Borchers, *Budgets*, 35 U. TOL. L. REV. 19 (2003).

308. *See* Murray, *supra* note 24.

309. Several vendors offer certifications in technology proficiency, including Procertas Legal Technology Assessment, Legal Technology Core Competencies Certification ("LTC4"), the global Legal Technology & Innovation Certificate ("LTIC"), and the NSLT Legal Office Technology Certificate. *Supra* note 92.

310. Jonella Frank, *OU Law's Digital Initiative: Charting the Course for Legal Education in the Digital Age*, 1 SOONER LAW. ARCHIVE 8, 11 (The University of Oklahoma launched this initiative to "tailor its legal education experience to meet the demands of the 21st-century legal profession" by "ensuring graduates are technologically adept in the digital world and have a competitive edge in the job market."). For more information on the Digital Initiative, see *Digital Initiative*, UNIV. OF OKLA. COLL. OF L., https://law.ou.edu/digitalinitiative [https://perma.cc/VQG5-8UBJ] (last visited Oct. 4, 2022).

significant commitment to teaching legal technology skills in their curriculum should consider creating immersive environments that emphasize practice-based technology training for every student throughout their law school career.

CONCLUSION

Several recent ABA formal opinions assert that technology is constantly changing.[311] Therefore, what it means to be a technologically competent lawyer, per the ethical rules, is also evolving. Since 2020, the legal technology marketplace has boomed due to the remote lawyering expectations set by the COVID-19 pandemic. As a result, attorneys can no longer avoid learning new practice-based technology skills. In January 2021, the NCBE announced that the bar examination would be changing to test the knowledge, skills, and abilities required for competent entry-level legal practice in a changing profession.[312] The foundational skills identified by the NCBE innately require technology competency.[313] As a result, several law schools are discussing how student support services and curricula can be modified to accommodate these future changes.[314] However, many institutions may not make changes until the new bar examination format is confirmed and released.

Law schools cannot wait until the new bar examination format is released or until states create a base curriculum for technology competence because technology advancement moves pretty fast. If law schools do not stop and notice how technology training allows for creating a more rigorous program, they will fail to graduate lawyers who are able to keep pace with the ethical duty of technology competence and the evolving practice of law.

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311. *See supra* Part I.

312. Testing Task Force, Nat'l Conf. of Bar Exam'rs, *The Next Generation of the Bar Exam: NCBE's Board of Trustees Approves the Recommendations of the Testing Task Force*, 90 BAR EXAM'R 16, 16 (2021).

313. For example, legal research will require competency in digital legal research databases, and personal interviews with law librarians who serve as members for the NextGen Bar Exam committee have uncovered these issues.

314. For example, at the Charleston School of Law, the executive leadership team has begun discussing potential changes to the curriculum.

APPENDIX A

2017 Legal Technology in Law School Survey		
Q1. Does your law school have a Legal Technology Center or Institute?		
Answer Choices	Response Percent	Responses
Yes	11.9%	5
No	88.1%	37
Other (please specify)		3
	Answered	42
	Skipped	1
Q2. Does you law school provide a specialization or LL.M. in legal technology?		
Answer Choices	Response Percent	Responses
Yes	2.33%	1
No	97.67%	42
Other (please specify)		1
	Answered	43
	Skipped	0
Q3. Does your law school offer a for credit Legal Technology or Law Office Technology type course?		
Answer Choices	Response Percent	Responses
Yes	43.9%	18
No	56.1%	23
Other (please specify)		3
	Answered	41
	Skipped	2

Q4. Please select all applicable instructors for the for credit legal technology courses.		
Answer Choices	Response Percent	Responses
N/A	43.59%	17
Professor	28.21%	11
Adjunct Professor	30.77%	12
Clinician	5.13%	2
Librarian (Non Faculty)	2.56%	1
Librarian (Faculty)	17.95%	7
Librarian (Adjunct Faculty)	0.0%	0
Other (please specify)		3
	Answered	39
	Skipped	4
Q5. Does your law school provide informal legal technology instruction to the law students?		
Answer Choices	Response Percent	Responses
Yes	65.85%	27
No	34.15%	14
Other (please specify)		2
	Answered	41
	Skipped	2
Q6. Please select all applicable forms of informal training offered at your school.		
Answer Choices	Response Percent	Responses
N/A	21.62%	8
Speaker series	8.11%	3

Workshops (day or multi-day)	16.22%	6
Brown bags or lunch and learns	45.95%	17
Library Certificate	8.11%	3
Technology Certificate	0.0%	0
Other (please specify)		8
	Answered	37
	Skipped	6
Q7. Please select all applicable instructors for the informal legal technology instruction.		
Answer Choices	Response Percent	Responses
N/A	25.0%	10
Professors	35.0%	14
Adjunct Professors	27.5%	11
Clinicians	20.0%	8
Librarians (Non Faculty)	32.5%	13
Librarians (Faculty)	45.0%	18
Librarians (Adjunct Faculty)	10.0%	4
Paraprofessionals	7.5%	3
Information Technology staff	32.5%	13
Career Counselors	0.0%	0
Student Services staff	7.5%	3
Students	15.0%	6
Individual or group affiliated with an undergraduate institution	2.5%	1
Contracted outside organization or individual (no instructional status)	2.5%	1

Other (please specify)		1
	Answered	40
	Skipped	3
Q8. Please select all applicable legal technology topics taught in the for credit technology courses offered at your law school.		
Answer Choices	Response Percent	Responses
N/A	45.71%	16
Document assembly and drafting	31.43%	11
Courtroom technology	22.86%	8
Decision support systems	14.29%	5
Ethics of legal technology	37.14%	13
Legal technology Start ups	20.0%	7
Code	11.43%	4
Marketing	14.29%	5
Matter and knowledge management	22.86%	8
New model law firms	20.0%	7
Online dispute resolutions	8.57%	3
Project Management	17.14%	6
Software development	14.29%	5
Legal process engineering	14.29%	5
Access to justice and legal technology	31.43%	11
Cloud computing	25.71%	9
Law firm web development	22.86%	8
Online Marketing	14.29%	5
Social Media and lawyering	37.14%	13

Computer security and law practice	31.43%	11
Other (please specify)		1
	Answered	35
	Skipped	8
Q9. Please select all applicable legal technology topics taught in the informal technology instruction offered at your law school.		
Answer Choices	Response Percent	Responses
N/A	31.43%	11
Document assembly and drafting	28.57%	10
Courtroom technology	28.57%	10
Decision support systems	0.0%	0
Ethics of legal technology	22.86%	8
Legal technology Start ups	11.43%	4
Code	2.86%	1
Marketing	14.29%	5
Matter and knowledge management	17.14%	6
New model law firms	2.86%	1
Online dispute resolutions	5.71%	2
Project Management	11.43%	4
Software development	5.71%	2
Legal process engineering	2.86%	1
Access to justice and legal technology	20.0%	7
Cloud computing	20.0%	7
Law firm web development	5.71%	2
Online Marketing	5.71%	2

Social Media and lawyering	22.86%	8
Computer security and law practice	22.86%	8
Other (please specify)		7
	Answered	35
	Skipped	8

Q10. Please select all applicable legal technology topics discussed in traditional doctrinal courses offered at your law school.

Answer Choices	Response Percent	Responses
N/A	37.5%	12
Document assembly and drafting	18.75%	6
Courtroom technology	31.25%	10
Decision support systems	6.25%	2
Ethics of legal technology	46.88%	15
Legal technology Start ups	6.25%	2
Code	0.0%	0
Marketing	12.5%	4
Matter and knowledge management	21.88%	7
New model law firms	18.75%	6
Online dispute resolutions	15.63%	5
Project Management	6.25%	2
Software development	6.25%	2
Legal process engineering	6.25%	2
Access to justice and legal technology	12.5%	4
Cloud computing	15.63%	5
Law firm web development	12.5%	4

Online Marketing	12.5%	4
Social Media and lawyering	34.38%	11
Computer security and law practice	28.13%	9
Other (please specify)		5
	Answered	32
	Skipped	11

APPENDIX B

2020 Legal Technology in Law School Survey		
Q1. Does your law school have a legal technology center or institute?		
Answer Choices	Response Percent	Responses
Yes	17.95%	7
No	82.05%	32
Other (please specify)		5
	Answered	39
	Skipped	3
Q2. Does your law school provide a specialization or L.L.M. in legal technology?		
Answer Choices	Response Percent	Responses
Yes	0.0%	0
No	100.0%	41
Other (please specify)		1
	Answered	41
	Skipped	1
Q3. Does your law school offer a for-credit legal technology or law office technology type course?		
Answer Choices	Response Percent	Responses
Yes	57.5%	23
No	42.5%	17
Other (please specify)		3
	Answered	40
	Skipped	2

Q4. Please select all applicable instructors for the for-credit legal technology courses		
Answer Choices	Response Percent	Responses
N/A	42.86%	18
Professor	26.19%	11
Adjunct	28.57%	12
Clinician	4.76%	2
Librarian (non-faculty)	7.14%	3
Librarian (faculty)	28.57%	12
Librarian (adjunct faculty)	9.52%	4
IT Director	4.76%	2
Other (please specify)		0.0
	Answered	42
	Skipped	0
Q5. Does your law school provide informal legal technology instruction to law students?		
Answer Choices	Response Percent	Responses
Yes	60.98%	25
No	39.02%	16
	Answered	41
	Skipped	1
Q6. Please select all applicable forms of informal training offered at your law school.		
Answer Choices	Response Percent	Responses
N/A	41.03%	16
Speaker Series	28.21%	11

Workshops (day or multi-day)	23.08%	9
Brown Bags/Lunch and Learns	43.59%	17
Library Certificate	7.69%	3
Technology certificate	10.26%	4
Other (please specify)		7
	Answered	39
	Skipped	3
Q7. Please select all Applicable instructors for the informal legal technology instruction offered at your school.		
Answer Choices	Response Percent	Responses
N/A	37.5%	15
Professors	37.5%	15
Adjunct Professors	25.0%	10
Clinicians	20.0%	8
Librarians (Non faculty)	15.0%	6
Librarians (faculty)	37.5%	15
Librarians (adjunct faculty)	7.5%	3
Paraprofessionals	0.0%	0
IT director	15.0%	6
IT staff	15.0%	6
Career Counselors	5.0%	2
Student Services Staff	0.0%	0
Individuals or group affiliated with an undergraduate Institution	0.0%	0
Contracted Outside organization or individual (no instructional status)	15.0%	6

Other (please specify)		1
	Answered	40
	Skipped	2
Q8. Please select all applicable legal technology topics taught in the for-credit technology course offered at your law school.		
Answer Choices	Response Percent	Responses
N/A	44.74%	17
Document assembly and drafting	36.84%	14
Courtroom technology	47.37%	18
Decision support systems	10.53%	4
Ethics of legal technology	44.74%	17
Legal technology startups	13.16%	5
Coding	13.16%	5
Marketing	18.42%	7
Matter and knowledge management	31.58%	12
New model law firms	26.32%	10
Online dispute resolution	7.89%	3
Project management	28.95%	11
Software development	7.89%	3
Legal process engineering	5.26%	2
Access to justice and legal technology	26.32%	10
Cloud computing	36.84%	14
Law firm web development	21.05%	8
Online marketing	21.05%	8
Social media and lawyering	50.0%	19

Computer security and law practice	44.74%	17
Word	39.47%	15
Excel	36.84%	14
Presentation technology	31.58%	12
Lean/Six Sigma/Agile	0.0%	0
Other (please specify)		4
	Answered	38
	Skipped	4

Q9. Please select all applicable legal technology topics taught in the informal technology course offered at your law school.

Answer Choices	Response Percent	Responses
N/A	44.44%	16
Document assembly and drafting	16.67%	6
Courtroom technology	13.89%	5
Decision support systems	2.78%	1
Ethics of legal technology	27.78%	10
Legal technology startups	8.33%	3
Coding	5.56%	2
Marketing	5.56%	2
Matter and knowledge management	22.22%	8
New model law firms	5.56%	2
Online dispute resolution	2.78%	1
Project management	11.11%	4
Software development	2.78%	1
Legal process engineering	0.0%	0

Access to justice and legal technology	11.11%	4
Cloud computing	5.56%	2
Law firm web development	8.33%	3
Online marketing	8.33%	3
Social media and lawyering	27.78%	10
Computer security and law practice	25.0%	9
Word	38.89%	14
Excel	33.33%	12
Presentation technology	11.11%	4
Lean/Six Sigma/Agile	0.0%	0
Other (please specify)		7
	Answered	36
	Skipped	6

Q10. Please select all applicable legal technology topics taught in the traditional doctrinal courses offered at your law school.

Answer Choices	Response Percent	Responses
N/A	50.0%	17
Document assembly and drafting	17.65%	6
Courtroom technology	17.65%	6
Decision support systems	2.94%	1
Ethics of legal technology	41.18%	14
Legal technology startups	11.76%	4
Coding	0.0%	0
Marketing	5.88%	2
Matter and knowledge management	11.76%	4

New model law firms	5.88%	2
Online dispute resolution	20.59%	7
Project management	8.82%	3
Software development	2.94%	1
Legal process engineering	2.94%	1
Access to justice and legal technology	17.65%	6
Cloud computing	0.0%	0
Law firm web development	0.0%	0
Online marketing	2.94%	1
Social media and lawyering	20.59%	7
Computer security and law practice	14.71%	5
Word	0.0%	0
Excel	0.0%	0
Presentation technology	5.88%	2
Lean/Six Sigma/Agile	2.94%	1
Other (please specify)		6
	Answered	34
	Skipped	8