

THE DAWN OF FULLY AUTOMATED CONTRACT DRAFTING: MACHINE LEARNING BREATHES NEW LIFE INTO A DECADES-OLD PROMISE

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ABSTRACT

Technological advances within contract drafting software have seemingly plateaued. Despite the decades-long hopes and promises of many commentators, critics doubt this technology will ever fully automate the drafting process. But, while there has been a lack of innovation in contract drafting software, technological advances have continued to improve contract review and analysis programs. “Machine learning,” the leading innovative force in these areas, has proven incredibly efficient, performing in mere minutes tasks that would otherwise take a team of lawyers tens of hours. Some contract drafting programs have already experimented with machine learning capabilities, and this technology may pave the way for the full automation of contract drafting. Although intellectual property, data access, and ethical obstacles may delay complete integration of machine learning into contract drafting, full automation is likely still viable.

INTRODUCTION

Transactional lawyers have been notoriously slow to integrate technology into their practices.¹ The prevailing opinion among these practitioners is that the reasoning required to draft complex transactional contracts is uniquely human, and beyond the capability of technology.² This reluctance to innovate has far-reaching effects: foregoing potentially

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¹ Kingsley Martin, *Emerging Contract Technology: Automating the Contract Life-Cycle*, LEGAL EXEC. INST. (Apr. 29, 2015).

² *Id.*

massive efficiency gains, and forestalling further investments in legal transactional innovation, generally. Likely responsible for this pessimism are the repeated, decades-old promises of sweeping technological innovations that never seem to materialize. Most notable is the promise that contract drafting will become increasingly automated, and that drafting software will “take over the document preparation function.”³ Unfortunately, automated contract drafting has seen little gains in the last 20 years. It is the legal parallel to *Back to the Future Part II*'s 1989 promise of “hoverboards” by 2015.⁴ However, despite the disappointing lack of robots drafting contracts and skateboards floating mid-air, innovation is indeed happening.⁵

The concept of the “contract lifecycle” provides a helpful framework for better understanding the current landscape of contract technology innovation. This lifecycle encompasses four stages: drafting, reviewing, managing, and analyzing contracts.⁶ The drafting stage involves writing the initial contract; reviewing involves identifying legal and business terms to improve a given contract; managing involves storing and indexing existing contracts; and analyzing involves measuring the market-performance of contracts and provisions within contracts.⁷ While technology for the drafting and managing stages can be traced to the 1970s, only recently has innovation taken hold in the review and analysis stages.⁸ It is this more recent innovation, in the review and analysis stages, and particularly its use of “machine learning,” that has many commentators excited.

This article explores the progression of innovation in contract drafting technology over the past few decades, from the early word-processing innovation in the drafting and management stages, through the more recent innovation and integration of machine learning, and predicts what the future may hold. Part I details the timeline of technological innovations within contract drafting. Part II discusses critics' concerns with modern-day drafting technology. Part III explains the concept of machine learning and its different applications within the contract lifecycle. Lastly, Part IV forecasts the effect machine learning may have on the future of contract drafting automation and discusses possible solutions to the obstacles that stand in the way.

³ See Stephen Mecca, *Law Office Automation: A View into the Future*, 45 R.I.B.J. 5, 27 (1996) (“[Automated Speech Recognition] coupled with sophisticated document assembly systems will take over the document preparation function.”).

⁴ BACK TO THE FUTURE PART II (Universal Pictures 1989).

⁵ Martin, *supra* note 1.

⁶ *Id.*

⁷ *Id.*

⁸ *Id.*

I. HISTORY AND PROGRESSION OF CONTRACT DRAFTING PROGRAMS

After several decades of innovation, contract drafting technology has hit a dead end. Throughout the 1990s, drafting technology was widely viewed as the future of the legal practice.⁹ As a result, an array of word processing developments and contract-specific software quickly spread across the legal market. After the 1990s, however, little progress was made. Now, many in the industry believe there is no room for—and no *need* for—future innovations.

A. *Origins and Early Development of Contract Drafting Programs*

Contract drafting software emerged in the 1970s and 1980s,¹⁰ and by the mid-1990s, word-processing programs such as WordPerfect were offering user-friendly tools.¹¹ These early programs included simple computer file management systems, automatic numbering tools, basic “master documents,” macros,¹² and document “merge” functions.¹³ The simplicity of these programs promised increased productivity, with only minimal training and upfront costs.¹⁴

By the 1990s, some practitioners were using “expert” drafting systems, which were more complex than common word processing tools.¹⁵ These drafting systems asked the user a series of questions based on a preprogrammed “logic tree,” then generated a document based on the user’s answers.¹⁶ Most of the text in the final document was “hard-coded,” preventing the user from making any changes after document generation.¹⁷

⁹ See, e.g., Mecca, *supra* note 3, at 26 (predicting that contract drafting software would sweep the legal industry in “the next few years”).

¹⁰ Marc Lauritsen, Current Frontiers in Legal Drafting Systems 2 (Dec. 1, 2014) (unpublished manuscript), available at https://www.researchgate.net/publication/228376699_Current_Frontiers_in_Legal_Drafting_Systems.

¹¹ David Dunn, *Easy Document Assembly with Word Processors*, 83 ILL. B.J. 93, 93 (1995).

¹² Macro stands for “macroinstruction” and is a programmable pattern that makes certain computing tasks less repetitive. *Macro*, COMPUTERHOPE.COM, <http://www.computerhope.com/jargon/m/macro.htm> (last visited Feb. 9, 2017).

¹³ Dunn, *supra* note 11, at 93–94.

¹⁴ *Id.* at 94; see also Kendall Callas, *Why Lawyers Love WordPerfect*, MICROCOUNSEL.COM (Sept. 2009), <http://www.microcounsel.com/nextgen.htm> (explaining that WordPerfect remains a favorite tool for attorneys, due to its ease of use and its “customizability and automation features,” as well as legal-specific tools).

¹⁵ Kenneth I. Guthrie, *Document Assembly Software Systems*, 9 PROBATE & PROPERTY 26, 27–28 (Dec. 1995).

¹⁶ *Id.* at 27.

¹⁷ *Id.* at 28. Some programs did allow minor changes, but the ability to do so was limited. *Id.*

If changes were necessary, the user would have to redo the questionnaire from the beginning.¹⁸ As a result, these programs were frequently tailored for stable practice groups, in which contracts rarely deviated from standard form documents.¹⁹

“Document assembly engines,” also available by the 1990s, offer a more flexible alternative.²⁰ With these programs, lawyers can modify or combine drafting templates with other text throughout the drafting process.²¹ These “context-sensitive” engines rely more on commentary and drafting notes than on preprogrammed logic, offering an alternative to the questionnaire format.²² This allows for more creativity and autonomy in contract creation.

B. Modern-Day Contract Drafting Programs

Since the turn of the century, contract drafting technology has become somewhat more sophisticated, but the underlying processes remain the same. Web-based programs now prevail over those requiring users to load software on individual devices. Programs like ContractExpress offer an improved, yet familiar, questionnaire-style document generation program.²³ Each successive answer in the questionnaire prompts a different series of follow-up questions to tailor the final document to the user’s specific needs,²⁴ providing for a larger, more customizable logic tree than one focused on only a single practice area. Like its predecessors, once the questionnaire is complete, the program then generates a contract from preloaded contract language.²⁵

Many of these programs require the user to create a “coded” contract by uploading and coding a preexisting contract. The program then uses the form contract to generate a questionnaire, which can be used to quickly draft similar documents. Because coding documents can be difficult, some programs code them automatically through artificial intelligence (“AI”).²⁶

¹⁸ *Id.*

¹⁹ *E.g.*, trust and estates planning. *Id.* Some examples of software include Trust Plus, WillWriter, and West’s Trust & Wills Document Assembly. *Id.*

²⁰ *Id.* at 29–30.

²¹ *Id.* at 30.

²² *Id.*

²³ Ken Adams & Tim Allen, *The Illusion of Quality in Contract Drafting*, N.Y.L.J. (July 17, 2012), <http://www.adamsdrafting.com/wp/wp-content/uploads/2014/05/Illusion-of-Quality-NYLJ.pdf>.

²⁴ *Id.*

²⁵ *Id.*

²⁶ Dante Manna, *Artificial Intelligence Insourcing: Why Software Technology Will Dominate Legal Process Outsourcing for Routine Document Drafting*, 12 CAN.

Each of these software programs is available for use by lawyers, by clients directly, or by a combination of the two.²⁷ For example, a lawyer may create the coded contract, then send the questionnaire to his client.²⁸ The client is then able to populate the questionnaire, and the lawyer can review and finalize the contract after the program produces it.²⁹ This flexibility, combined with the speed at which these programs can create documents, reduces client costs and frees up lawyers' time to focus on less mechanical tasks.³⁰

The efficiency benefits have not gone unnoticed by lawyers. By 2014, 54.7% of all lawyers reported that contract drafting software was available for use at their firms,³¹ with 37.2% of lawyers stating that they regularly used the software for law-related tasks.³² And, those who use the software reported 92% satisfaction.³³ Although this data shows that contract drafting software is making inroads into legal practices, a great majority of the legal work created with these programs is fairly routine and high-volume.³⁴

In short, the available contract drafting software is most useful in practices in which future contracts are going to closely approximate existing contracts.³⁵ For example, real estate leases, trusts and estates, and routine divorce papers benefit greatly from existing options for automation and coded documents.³⁶ Conversely, the available programs are ill-suited for complex commercial deals and more nuanced agreements.

J.L. & TECH. 109, 127 (2014) (describing Bloomberg's "DealBuilder" program, which uses AI to automatically create form documents from existing contracts).

²⁷ Lauritsen, *Current Frontiers*, *supra* note 10, at 2.

²⁸ *Id.*

²⁹ *Id.*

³⁰ Manna, *Artificial Intelligence*, *supra* note 26, at 129–30 (discussing that the efficiency advantage created by using computer technology enables lawyers to spend more time focusing on more sophisticated, more desirable work, as well as relieving junior lawyers from "repetitive mechanical work").

³¹ AM. BAR ASSOC., 2014 ABA TECHNOLOGY SURVEY REPORT II-38 (2014). The ABA Report focuses on the use of "document assembly" programs, which it defines as "application[s] that help[] in the creation of documents through the use of archived information and templates." *Id.*

³² *Id.* at II-49.

³³ *See id.* at II-54 (the 92% satisfaction rate comes from adding the survey's 33.2% of lawyers who are very satisfied with the 58.8% of lawyers who are somewhat satisfied).

³⁴ Lauritsen, *Current Frontiers*, *supra* note 10, at 2–3.

³⁵ Manna, *Artificial Intelligence*, *supra* note 26, at 116.

³⁶ Carol L. Schlein, *Take Your Document Production Further: Document Assembly Software Can Help Remove Tedium and Risk from Drafting*, 24 LAW. PC, NO. 17, 2007, at 5; Lauritsen, *Current Frontiers*, *supra* note 10, at 1.

Beyond periodically improving the mechanisms for producing standard, repetitive contracts, innovation in contract drafting software has essentially plateaued.³⁷ The past twenty years have seen minimal innovation. Modern programs still use either coded forms or logic-driven questionnaires—the same technology that was available in the mid-1990s.

II. PROBLEMS WITH AND CRITICISMS OF CONTRACT DRAFTING PROGRAMS

Existing contract drafting software leaves much to be desired. Though many users are satisfied with contract drafting software, other practitioners refuse to use the software, or find that the software falls short of their needs. The programs remain largely inflexible and thus leave little room for practitioner insight or creative language. Further, the more restrictive the program, the more the lawyer is forced to rely on the program's ability to self-update, without much control over whether the underlying questionnaires or form documents comply with changing legal rules. This leaves many lawyers with questions of ethical dilemmas and fears of committing malpractice. Lastly, many in the legal field are hesitant to invest in greater automation, for fear of realizing their greatest nightmare: job attrition.

A. *Contract Drafting Programs Limit Ingenuity and Customization*

Some practitioners have criticized contract drafting programs as offering little more than “bare-bones,” “fill-in-the-blanks” capabilities, without room for “meaningful customization.”³⁸ Because the underlying algorithms use a limited universe of questions and answers, and because the contract generation tools are limited to preloaded contract language, the software has not been able to serve the needs of idiosyncratic clients or more irregular types of transactions. Even in fairly routine practice areas, the programs have little room to grow and adapt to new situations or needs: if it is not part of the preprogramming, the software simply cannot do it. And, unfortunately, even the best programmers cannot foresee all possible scenarios at the time they craft the original algorithms.

³⁷ See, e.g., Ken Adams, *Why Contract Automation Isn't Among Bob Ambrogio's 10 Most Important Legal Technology Developments of 2014*, CONTRACTEXPRESS (Dec. 31, 2014), <http://www.contractexpress.com/2014/12/why-contract-automation-isnt-among-bob-ambrogis-10-most-important-legal-technology-developments-of-2014/> (stating that contract automation technology is “mature;” existing programs already offer “everything that even the most demanding user would need for sophisticated document assembly”).

³⁸ Ken Adams, *Avvo Legal Forms: A Real Stinker*, ADAMS ON CONTRACT DRAFTING (Apr. 8, 2016), <http://www.adamsdrafting.com/avvo-legal-forms-a-real-stinker/>.

As a result, the programs are inherently limited, in such a way that renders them mostly useless to many practitioners.

B. Increased Reliance on Computer Programs Raises Ethical Questions for Both Practitioners and Their Clients

From an ethical standpoint, the inherent inflexibility of these programs is particularly troublesome. When the underlying law changes or other events occur, lawyers must adapt to new formats or include entirely new types of contractual clauses. To keep up with such changes, lawyers will need to periodically re-code form documents,³⁹ and may need to perform their own diligence to make sure that the drafting software's logic tree and output reflect their jurisdiction's most recent law.⁴⁰ For some programs, the logic trees are immutable, beyond the control of users. In these instances, users will likely be forced to abandon the program and do the work manually, while waiting for the next program version or update. Where lawyers have relied on drafting programs consistently, switching to manual drafting could be a lofty and frustrating task, on top of its increasing input efforts. This creates significant inefficiencies and might prevent attorneys from ever being able to fully accept and rely on contract drafting programs, until programs are able to promise guaranteed and reliable updating mechanisms.

C. Lawyers are Hesitant to Transition to Technology That May Replace Their Jobs

Lawyers are hesitant to invest in and rely upon cutting-edge technology that may eventually diminish the need for their personal services. The fear of losing legal jobs to “robots” and computers has given every modern lawyer some amount of panic. Technology repeatedly promises clients that it will render lawyers—and their accompanying attorney fees—obsolete.⁴¹ Few lawyers are eager to help bring about this revolution. As a result, any discussion of legal technology with fellow attorneys inevitably meets with some resistance.

³⁹ Guthrie, *supra* note 15, at 28.

⁴⁰ *See id.* (expressing concern that these types of programs force lawyers to rely on the programs' abilities to update themselves as the law changes).

⁴¹ *See, e.g.,* Jeremy Kahn, *Mike Lynch's Invoke Aims to Replace M&A Lawyers with Robots*, BLOOMBERG (Sept. 14, 2016.), <http://www.bloomberg.com/news/articles/2016-09-14/mike-lynch-s-invoke-aims-to-replace-m-a-lawyers-with-robots> (discussing an up-and-coming M&A program, Luminance, and its goal of automating M&A deals).

But most commentators and investors seem to agree that, although technological advances may reduce the need for new associates,⁴² the dawn of “robot lawyers” is likely not upon us.⁴³ Clients are not motivated by discrete, mathematically quantifiable interests, and no two clients are alike. For example, while clients care about both cost-efficiency and minimizing risks, clients will differ on the relative values they assign to risks depending on their individual priorities and preferences. Consequently, much of a lawyer’s value is in his ability to help clients achieve solutions that creatively and appropriately balance competing interests. Computers, though increasingly efficient at information processing, have yet to achieve this skill and ingenuity. Beyond that, personal referrals, community reputation, interpersonal skills, human empathy, and ethical restrictions will continue to bring lawyers new business.⁴⁴

History is some condolence: technological innovation is not new to the legal profession. Lawyers are adaptable, and those that learn to coexist with technological advances will be more likely to continue to

⁴² See, e.g., Alexander LeVeque, *Lawyers: Learn to Work with AI or Risk Termination*, VEGASINC (Sept. 26, 2016, 2:00 AM), <http://vegasinc.com/news/2016/sep/26/lawyers-learn-to-work-with-ai-or-risk-termination/> (“[W]ork that has traditionally been reserved for new associates will be increasingly handled by AI.”); Thomas Martin, *How I Learned to Embrace the Law Robot Revolution*, LAW TECH. TODAY (Oct. 4, 2016), <http://www.lawtechnologytoday.org/2016/10/learned-embrace-law-robot-revolution/> (“[T]he number of lawyers needed in the future will be a mere fraction of what it is today.”); Elaine Ou, *Why Hire a Lawyer When a Robot Will Do?*, BLOOMBERGVIEW (Sept. 22, 2016, 3:00 AM), <https://www.bloomberg.com/view/articles/2016-09-22/why-hire-a-lawyer-when-a-robot-will-do> (stating that the need for human lawyers will diminish as technology continues to improve).

⁴³ Martin, *supra* note 42 (“Robots won’t replace lawyers.”); James O’Toole, *Here Come the Robot Lawyers*, CNN MONEY: TECH (Mar. 28, 2014, 7:16 AM), <http://money.cnn.com/2014/03/28/technology/innovation/robot-lawyers/index.html> (“[N]o one thinks the [legal] profession can be automated entirely.”). Even venture capital (“VC”) investors in legal technology do not see the rise of computer technology as the “end of the legal profession.” See Rob Price, *Tech Billionaire Mike Lynch: ‘You’re Seeing the Beginning of a New Age,’* BUS. INSIDER (Sept. 17, 2016), <http://www.businessinsider.com/tech-investor-mike-lynch-invoke-luminance-brexite-investing-artificial-intelligence-2016-9> (summarizing the opinion of VC Mike Lynch, the primary investor behind a new due diligence engine Luminance).

⁴⁴ Martin, *supra* note 42; Susan Cartier Liebel, *Use Tech, Yes, But Your Law Firm Must be Client-Centric*, ABA J. (Jan. 1, 2017, 1:40 AM), http://www.abajournal.com/magazine/article/client_centric_law_practice.

enjoy successful careers.⁴⁵ In fact, investing in cost-saving technology is likely to *add* value for clients, thus potentially further promoting a lawyer's brand. Instead of the fall of the attorney, therefore, we might only see the fall of the billable hour, as tech-savvy attorneys are able to offer more value in less time.

In summary, twenty years of reusing the same underlying algorithms and processes have not been able to offer a practical amount of customizability nor resolve ethical problems created by relying on technology for legal work, and many attorneys remain skeptical of technological advances altogether. As a result, a new source of technological innovation in contract drafting software is long overdue. Any preloaded language or pre-prepared questionnaire, no matter how comprehensive, will inevitably fall victim to some degree of inflexibility and ethical shortcomings. But an answer might be found in a computer process called "machine learning."

III. MACHINE LEARNING AND THE CONTRACT LIFECYCLE

Machine learning involves a computer processor "learning" by reviewing and interacting with a series of examples.⁴⁶ The processor uses a complex system of algorithms to process data and provide feedback to further improve its algorithms.⁴⁷ Simply, machine learning is a computer's way of becoming better at its tasks.⁴⁸ After processing enough successive examples, a machine learning program can teach itself to identify new examples to better fit the user's liking.⁴⁹

⁴⁵ See LeVeque, *supra* note 42 ("[T]here will always be a need for lawyers who understand the technology and how it can be effectively implemented into practice."); see also Ou, *supra* note 42 (explaining that even the most cutting-edge legal tools are essentially glorified search engines, using similar algorithms and simply "organizing massive piles of legal documents into smaller piles"); but see LeVeque, *supra* note 42 ("I don't get technology" is no longer an excuse that a client will accept.).

⁴⁶ Dylan Love, *What the Heck is Machine Learning?*, BUS. INSIDER (May 3, 2014, 9:51 AM), <http://www.businessinsider.com/machine-learning-2014-5>.

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ *Id.* For perfect processing, this could require several thousands of examples. *Id.* However, machine learning is able to begin identifying examples—with slightly less precision—much sooner. For example, Kira, a due diligence program, is able to identify newly learned contract provisions after only twenty or fewer examples, with close to 90% accuracy. Videoconference Interview with Andy Kim, Marketing Coordinator, Kira Systems (April 5, 2016).

Machine learning has been wildly successful in other parts of the contract lifecycle, such as contract analysis in due diligence. For example, Kira Systems, a web-based due diligence engine that received the 2015 International M&A Technology Product Award,⁵⁰ can identify various contract provisions and critical data in non-standard formats, like tables and forms.⁵¹ Rather than using a keyword search function, Kira identifies provisions based on its previous processing of similar provisions.⁵² Kira then gains a broader understanding of the provisions the user wants Kira to identify.⁵³ Kira achieves this understanding regardless of the consistency in wording or use of familiar terms.⁵⁴ Additionally, because Kira uses machine learning, it is not limited to a finite universe of preloaded content. Instead, users can *teach* Kira to identify an ever-expanding universe of new types of provisions. Thus, Kira, unlike logic-tree programs, may be customized to individual practitioners' or practice groups' needs.⁵⁵

Machine learning's application to the legal field has been met with warm regard. In its inaugural year, Kira was used in over \$100 billion worth of deals⁵⁶ and trusted by accounting firms, law firms, and businesses of all sizes.⁵⁷ On individual projects alone, clients have estimated savings of over \$500,000 and up to 5,000 work hours from using Kira instead of human processing.⁵⁸ This saves approximately 20-60% of the time it would otherwise take clients to manually review the same contracts, in the

⁵⁰ Andy Kim, *Kira Diligence Engine Named International M&A Product of the Year by ACQ Global Awards 2015*, YAHOO! FINANCE (Oct. 20, 2015, 5:49 PM), <http://finance.yahoo.com/news/kira-diligence-engine-named-international-214900876.html>; see also Khan, *supra* note 41 (describing Luminance, a new machine learning due diligence engine).

⁵¹ *AI Pioneer Kira Releases Major Update to Machine Learning Software*, ARTIFICIAL LAW. (Sept. 5, 2016), <https://artificiallawyer.com/2016/09/05/ai-pioneer-kira-releases-major-update-to-machine-learning-software/>; *Kira for Due Diligence*, KIRA, <https://kirasystems.com/how-it-works/due-diligence> (last visited Apr. 24, 2016).

⁵² Videoconference Interview with Andy Kim, Marketing Coordinator, Kira Systems (April 5, 2016).

⁵³ *Id.*

⁵⁴ *Id.*

⁵⁵ See *How Law Departments Use Kira*, KIRA, <https://kirasystems.com/benefits/corporations> (last visited Apr. 24, 2016) (explaining Kira's "Quick Study" feature, which allows users to teach Kira to identify new types of provisions).

⁵⁶ KIRA, <https://kirasystems.com/> (last visited Apr. 24, 2016).

⁵⁷ Videoconference Interview with Andy Kim, Marketing Coordinator, Kira Systems (Apr. 5, 2016).

⁵⁸ See, e.g., *Case Study: Elevate Saves Client \$500,000 and Over 5,000 Work Hours with Kira*, KIRA, <http://info.kirasystems.com/case-study-elevate-partners-with-kira> (last visited Apr. 24, 2016).

same amount of detail.⁵⁹ In fact, several Big Law giants have begun using Kira as part of their regular legal practices.⁶⁰ These law firms report overwhelmingly positive experiences, praising Kira for its customizability,⁶¹ its ease of integration and its ability to help the firms deliver greater value to their clients,⁶² and its usefulness in mitigating risk from human error.⁶³ Machine learning can save attorneys many hours of work and potentially save clients a substantial amount of money. Where, then, is machine learning when it comes to *drafting* contracts?

Some contract drafting technology companies have begun to experiment with machine learning algorithms. LexPredict and Bloomberg's Corporate Transactions tools use these algorithms to process publicly available contracts and suggest drafting language based on these contracts.⁶⁴ Each of these programs targets contracts stored on large databases, such as the Securities and Exchange Commission's ("SEC's") online database, EDGAR.⁶⁵ Large databases enable the programs to review a much larger number of contracts, which, through machine learning, allows the programs to expand their knowledge bases much more quickly.

⁵⁹ *How Law Departments Use Kira*, *supra* note 55. The team at Kira claims its program catches on average 90% of all relevant contract language, whereas junior associates on first-level review catch between 57–64% of all relevant contract language. Email correspondence with Andy Kim, Marketing Coordinator, Kira Systems (Sept. 15, 2016).

⁶⁰ See Victoria Basham, *Clifford Chance Partners with AI System Kira*, GLOBAL LEGAL POST (July 5, 2016, 9:00 AM), <http://www.globallegalpost.com/big-stories/clifford-chance-partners-with-ai-system-kira-92159631/> (reporting that Clifford Chance, a large UK-based law firm, began using Kira Systems); *DLA Piper Partners with Kira Systems to Leverage Artificial Intelligence Tool for M&A Due Diligence*, DLA PIPER (June 14, 2016), <https://www.dlapiper.com/en/us/news/2016/06/dla-piper-partners-with-kira-systems/> (announcing leading law firm DLA Piper's decision to integrate Kira into its practice); *Freshfields Partners with Kira Systems*, LEGAL IT INSIDER (Sept. 26, 2016, 12:24 PM), <http://www.legaltechnology.com/latest-news/freshfields-partners-with-kira-systems/> (explaining Freshfields Bruckhaus Deringer's recent integration of Kira into its practice).

⁶¹ *Freshfields Partners with Kira*, *supra* note 60.

⁶² Basham, *supra* note 60.

⁶³ *DLA Piper Partners with Kira*, *supra* note 60.

⁶⁴ Ken Adams, *Some Thoughts on LexPredict*, ADAMS ON CONTRACT DRAFTING (July 2, 2015), <http://www.adamsdrafting.com/some-thoughts-on-lexpredict/>; David Lat, *The Future of Law and Technology: An Interview with Bloomberg BNA's David Perla*, ABOVE THE LAW (Aug. 27, 2015, 1:11 PM), <http://abovethelaw.com/2015/08/the-future-of-law-and-technology-an-interview-with-bloomberg-bnas-david-perla/>.

⁶⁵ EDGAR can be accessed at <http://www.sec.gov/edgar.shtml>.

As these programs sift through the databases, the algorithm learns which contractual language and which provisions are “standard,” that is, which language and provisions appear most frequently.⁶⁶ Once the algorithm understands standard versus nonstandard language, it then internally sorts contracts based on the degree to which each contract conforms to or departs from the standard language.⁶⁷ Based on this analysis, the software is able to identify a single “standard” document that contains the least amount of deal-specific, non-standard language available.⁶⁸ When later creating model forms to be used in the drafting process, the algorithm is able to start its document creation processes from the contracts that most conform with what it understands to be standard language.⁶⁹ In situations without standard contracts, the algorithm is able to aggregate standard clauses from across multiple contracts to approximate a single standard document.⁷⁰

Despite their promise, reception of these machine learning contract drafting programs has been mixed at best. Some practitioners argue that these programs fail, because they are unable to distinguish between high and low quality language.⁷¹ Because the public databases these programs rely upon do not sort contracts based on the quality of drafting,⁷² the machine learning programs learn from both proper and improper drafting, without the ability to distinguish between the two. As a result, the contract provisions generated by these algorithms sometimes “parrot” confusing or poorly written language, in a sort of “garbage-in, garbage-out” cycle.⁷³ Thus, the same fatal flaw that has haunted contract drafting technology for decades remains: the computer’s inability to produce *novel* language.⁷⁴

⁶⁶ See Kingsley Martin, *Garbage-In, Quality-Out*, CONTRACT ANALYSIS AND CONTRACT STANDARDS (June 26, 2011), <http://contractanalysis.blogspot.com/2011/06/garbage-in-quality-out.html>.

⁶⁷ See *id.*

⁶⁸ See *id.*

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ See, e.g., Ken Adams, *Some Thoughts on “Bloomberg Law: Corporate Transactions,”* CONTRACT EXPRESS (May 26, 2015), <http://www.contractexpress.com/2015/05/some-thoughts-on-bloomberg-law-corporate-transactions/> (stating that the large deals databases are “one big mess” of unorganized information, devoid of the “editorial control” necessary to distinguish high-quality contract language).

⁷² *Id.*

⁷³ *Id.*

⁷⁴ Ken Adams, *More About Garbage-In, Garbage-Out*, ADAMS ON CONTRACT DRAFTING (June 27, 2011), <http://www.adamsdrafting.com/more-about-garbage-in-garbage-out/>. However, computers such as IBM’s Watson have already been

IV. THE FUTURE OF CONTRACT DRAFTING: IS AUTOMATION PLAUSIBLE?

Is automated contract drafting still a pipe dream? Although many commentators think full automation will never materialize, others still believe it is achievable.⁷⁵ The latter see the lawyer's pattern recognition skills as abstract and universal, and not uniquely human.⁷⁶ Under this view, contract drafting is particularly ripe for automation. Contracts are largely based on patterns, in both language and structure.⁷⁷ Together, contracts create further patterns, in terms of the types of transactions and markets they serve.⁷⁸ Assuming that computing technology progresses, a machine learning program could observe this patterned language and its resulting market performance, and inform the software's drafting decisions accordingly.⁷⁹ If such performance data can be collected and evaluated, it is only a matter of time before the drafting process is fully automated.

Yet, even assuming that the necessary technological advances occur, other substantial obstacles remain: 1) a lack of contract performance data; 2) barriers to parties publishing contract language and performance information in a comprehensive public database; and 3) practical and ethical restrictions. These barriers are formidable and fully automated contract drafting is still a long way from becoming a reality. Nonetheless, through promoting greater use of contract management technologies,

able to sort through information and determine its quality and relevancy. *See* Martin, *supra* note 66. Further, since the SEC's EDGAR database is a collection of real transaction materials, composed by some of the country's top lawyers, it is somewhat unfair to assume that any of it is "garbage." *See id.*

⁷⁵ *See* Lat, *supra* note 64 ("The conversation of the next ten years is going to be about machine learning."); *see also* Oliver R. Goodenough, *A Tale of Two Conversations: Is What Lawyers Do Really Special Enough to Be an Exception to Automation?*, LEGAL TECH. BLOG (Mar. 23, 2015), <http://lawprofessors.typepad.com/legaltech/2015/03/a-tale-of-two-conversations-is-what-lawyers-do-really-special-enough-to-be-an-exception-to-automatio.html> (explaining that "the arrogance of our profession can be so tiresome" in response to the view that "there [is] something inherently special about what lawyers do that will prevent the successful automation of those processes").

⁷⁶ *See* Goodenough, *supra* note 75.

⁷⁷ *See* Erik F. Gerding, *Contract as Pattern Language*, 88 WASH. L. REV. 1323, 1327 (2013) ("[P]atterns enable the transformation of contractual provisions into contracts, contracts into transactions, and transactions into markets.").

⁷⁸ *Id.*

⁷⁹ *See generally* Harry Surden, *Computable Contracts*, 46 U.C. DAVIS L. REV. 629 (2012) (explaining that providing computers with data relevant to contract compliance or performance could automate previously manual comparisons between promised terms and actual party activities, significantly reducing transaction costs).

revising intellectual property laws to spur investment in data procurement,⁸⁰ and reforming restrictions on the unauthorized practice of law, these obstacles can be overcome.

A. Generating Contract Performance Data Through Contract Management Software

For contract drafting to be properly automated, contract performance data must be produced. Because contracts are between private parties, the parties themselves have the best—and usually the only—access to performance data. But contracting parties frequently fail to track this data due to poor or overburdened contract management systems.⁸¹ Kira Systems estimates this management failure causes the average company to lose 5–12% of the potential value of its contracts.⁸² Consequently, if contract management systems are so poor that companies are losing substantial value from their own contracts, there is little reason to believe that companies are adequately tracking contract performance. As a result, there cannot be public access to such data, because the data does not exist. And this lack of privately retained data could drastically undermine the practical impact of any technological advances.

Innovative contract management programs, however, might offer a solution to this problem. Software such as Contract Assistant allows companies to index, track, review, and assess each of their contracts in a single, integrated system.⁸³ Organizations of all sizes and corporate purposes have been able to use this software to successfully monitor their contracts in a comprehensive, searchable, and easily managed database.⁸⁴

⁸⁰ See Kevin E. Davis, *Contracts as Technology*, 88 N.Y.U. L. REV. 83, 106 (2013) (explaining that allowing copyright holders to prevent copying works that are derived from their documents would stimulate innovation by enhancing “drafters’ legal rights to appropriate the benefits their documents confer upon copiers and thereby increase the pecuniary benefits of innovation”).

⁸¹ See PROSIDIAN CONSULTING, L.L.C., *MANAGING CONTRACT RISKS: THE INCREASED IMPORTANCE OF CONTRACTS AS A RISK MANAGEMENT TOOL* at 3 (2011), <http://www.prosidian.com/assets/pdfs/Managing%20Contract%20Risks%20-%20Importance%20Of%20Contracts%20As%20A%20Risk%20Management%20Tool.pdf> (explaining that, as companies increasingly deal with more contracts and more complex contracts, companies become ineffective at managing their contracts, collectively costing businesses more than \$150 billion a year).

⁸² See *How Law Departments Use Kira*, *supra* note 55.

⁸³ See, e.g., *Enterprise Edition: The Most Full-Featured Version*, CONTRACT ASSISTANT, <http://contractassistant.com/contract-software-product-information/contract-assistant-enterprise-edition/> (last visited Apr. 27, 2016).

⁸⁴ See, e.g., *Testimonials*, CONTRACT ASSISTANT, <http://contractassistant.com/about-us/testimonials/> (last visited Apr. 27, 2016).

With a variety of contract management products now available, the solution is increasingly affordable and customizable.⁸⁵ With the spread of these software-based solutions, companies will generate more reliable data on contract performance. This performance data can then shed light onto the value of corresponding contractual provisions to assist machine learning processes in sifting through the “garbage.”

B. Encouraging Publication of Data Through Intellectual Property Reforms

Even if contracting parties more efficiently retain data, they must disclose it for computers to access it. Although some public agencies, like the SEC, provide access to contracts through large databases, these contracts are limited in scope and are not included for their intrinsic value.⁸⁶ For example, the SEC’s EDGAR database publishes contracts solely for the purpose of informing shareholders about corporate undertakings, regardless of the quality of the contractual provisions contained in these contracts. It is here the “garbage in, garbage out” critique rings true.⁸⁷ Further, the SEC and other agencies are only able to publish contracts pursuant to mandatory corporate filing obligations. Unfortunately for public data, the vast majority of contracts are not subject to these requirements⁸⁸ and remain private. To be most effective, machine learning programs will need to have access to valuable private contracts as well.

Unfortunately, there are major deterrents to publishing contracts that are not otherwise subject to filing requirements. Perhaps most importantly, law firms are likely reluctant to share language they spend countless hours and resources producing. Contract language in practice does not receive much copyright protection because the language is easy to emulate, meaning that those who come up with original contract language are rarely compensated when their ideas are reproduced.⁸⁹ Currently, only the most literal forms of copying violate the copyright

⁸⁵ For a list of some of the available programs and program descriptions, see *Top Contract Management Software Products*, CAPTERRA, <http://www.capterra.com/contract-management-software/> (last visited Apr. 27, 2016).

⁸⁶ See Davis, *supra* note 80, at 126 (“Few public agencies appear to disseminate contracts for their intrinsic value.”).

⁸⁷ See Adams, *supra* note 71.

⁸⁸ See 15 U.S.C. §§ 781(b), (g), (m), (o) (2012) (prescribing that only certain large issuers of securities are subject to the SEC’s continuous filing obligations). Even companies who are subject to the SEC’s filing requirements are not obligated to disclose the terms of every contract into which they enter.

⁸⁹ Davis, *supra* note 80, at 106.

protections afforded to contracts.⁹⁰ Where lawyers have created particularly innovative contract language, this innovation could add great value to their legal services, value that no one is eager to give away for free.

One potential remedy is to strengthen intellectual property protections for innovative contractual language.⁹¹ This language could be protected under patents or as trade secrets.⁹² Current patent rules, however, do not allow for this to be patented, or at least make obtaining a patent difficult.⁹³ Relaxing this process could encourage lawyers to share the valuable language they produce. In turn, lawyers might invest further in developing innovative language for computers to process, adding yet more value to the marketplace.⁹⁴

There are potential problems with this approach, however. Small firms might not be able to afford such protected language, resulting in these firms losing their competitive edge as a cost-efficient option for clients. If many of these firms drop out of the marketplace, less innovative language is created, defeating the purpose of IP protections. On the other hand, if the price is worth obtaining the language, these firms should be able to pass some of the cost on to their clients while making all parties better off.

Despite the best economic arguments for IP protections, however, lawyers might remain hesitant to disclose. They might fear that their protected language would be used by opposing counsel, not directly in their own contracts, but to prepare for negotiations. As a result, skilled and experienced lawyers would be less able to use their drafting wherewithal to assist their clients. This undercuts the value of disclosure. Protecting contractual language through IP laws is therefore no panacea, although it is likely a step in the right direction.

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² *Id.* Care must be taken, however, to ensure that any intellectual property reforms are not abused. *See id.* (explaining that intellectual property rights may be problematic because they “may allow rights-holders to appropriate the benefits of copying documents that are valuable simply because they are familiar, rather than because of their intrinsic value”).

⁹³ *Id.*

⁹⁴ *See id.* at 105 (explaining that failing to protect contract language “implies that producers will have sub-optimal incentives to invest in innovation”).

C. Enabling Full Automation of Contract Drafting by Reforming Ethical Restrictions

Contract drafting automation can only progress as far as legal ethics allow. A pillar of legal ethics is that only licensed attorneys may “practice law,” or perform any legal task.⁹⁵ When a non-attorney performs legal tasks without attorney supervision, her actions constitute the “unauthorized practice of law.”⁹⁶ In *Lola v. Skadden, Arps, Slate, Meagher & Flom, LLP*, the Second Circuit held that document review did not *per se* constitute the “practice of law,” which opened the way for Kira Systems and other technologies to continue to outsource this labor to non-attorneys, and specifically, to computers.⁹⁷ *Lola* in fact went a step farther, stating that it was at least plausible that undertaking “tasks that could otherwise be performed entirely by a machine” cannot qualify as practicing law.⁹⁸

Currently, no court has paved the way for contract drafting to receive similar treatment and some practitioners and jurisdictions even caution that *any* preparation by machines may constitute the unauthorized practice of law.⁹⁹ Fortunately, the court’s reasoning in *Lola* suggests a trend in legal ethics regarding new technology: where technology has created a fair and efficient solution, ethics will catch up.

⁹⁵ See MODEL RULES OF PROF’L CONDUCT r. 5.5(a) (AM. BAR ASS’N 1983) (prohibiting a lawyer not admitted to practice in any given jurisdiction from practicing law).

⁹⁶ *Unauthorized Practice of Law Law & Legal Definition*, USLEGAL, <http://definitions.uslegal.com/u/unauthorized-practice-of-law/> (last visited Apr. 27, 2016).

⁹⁷ *Lola v. Skadden, Arps, Slate, Meagher & Flom, LLP*, 620 Fed. Appx. 37, 44–45 (2d Cir. 2015); see Joe Patrice, *Legal Technology Landscape Rocked by Contract Attorney Overtime Decision*, ABOVE THE LAW (Aug. 27, 2015), <http://abovethelaw.com/2015/08/legal-technology-landscape-rocked-by-contract-attorney-overtime-decision/?rf=1>.

⁹⁸ *Lola*, 620 Fed. Appx. at 45.

⁹⁹ See, e.g., Penn. Bar Assoc. Unauthorized Practice of Law Comm., Formal Opinion 2010-01 (Mar. 10, 2010), available at <http://www.pabar.org/public/committees/unautpra/Opinions/2010-01LglDocumentPreparation.pdf> (declaring any preparation of legal documents by a computer to be the unauthorized practice of law); Conn. Bar Assoc. Unauthorized Practice of Law Comm., Informal Opinion 2008-01 (2008), available at https://c.ymcdn.com/sites/ctbar.site-ym.com/resource/group/776a1a25-71dc-4190-95d2-4793e945208a/Unauthorized_Practice_of_Law_Committee/08-01.pdf (finding reasonable grounds to believe the web-based document generation program We The People to amount to the unauthorized practice of law).

CONCLUSION

Although technological advances in contract drafting have plateaued, fully automated contract drafting might still be attainable. Machine learning has revolutionized contract review and analysis, and may be the key to full automation. But in order for full automation to occur, certain non-technological obstacles must be overcome: 1) the collection of contract performance data, 2) publication of private contracts and their corresponding performance data, and 3) changes in the ethical restraints on computer usage in legal practice. This will be a lengthy process, but our suggested policy initiatives may provide a starting point. First, encouraging greater implementation of contract management software may lead to the creation and collection of contract performance data. Second, expanding copyright protection to cover innovative contractual language may increase the volume and quality of available contract data. And, finally, reforming ethical rules regarding the unauthorized practice of law may enable full automation. If these initiatives can be achieved, the dawn of fully automated contract drafting may very well be upon us.