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INTEGRATING MACHINE LEARNING IN LAW:
A PRÉCIS OF BEST PRACTICES FOR INITIAL LAW FIRM ADOPTION

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ABSTRACT

Much of the mystery surrounding machine learning lays not just in how it functions, but in how it is applied. This is especially true in the field of law, where the

implementation of artificial intelligence has lagged other fields. This précis distills best practices of machine learning implementation and applies them succinctly to the unique environment of law. Guiding principles and considerations are provided for the technology team, the nature of law firm data, and the commitment level of the adopting law firm.

I. INTRODUCTION

Machine learning[1] is often referred to as a "black box" due to the mystery surrounding how such platforms function.[2] The platform digests massive amounts of data on one side, and then produces meaningful correlations and predictions on the other with little explanation of what happens in between. Even the data scientists creating such platforms may have difficulty describing the *exact* manner in which results are produced.[3]

To some extent, the integration of machine learning platforms into daily legal practice and law firm management also presents a black box. Innovators of machine learning technology often dazzle law firm leaders with the predictive capabilities and detailed features of their system, yet the manner in which such technology can be integrated in the daily practice of law and law firm management remains an open question. For instance, a platform may be able to turn a host of variables into exceptionally precise legal cost estimations for a litigation matter, but how do attorneys collect and input such data in the course of their daily practice (such as during client intake and throughout case discovery)? And how do attorneys utilize and present such information to clients? Do they fully disclose platform predictions or edit them to align with their own assessments?[4]

These questions along with a host of others present challenges in the assimilation of machine learning in law. Relative to other fields, the legal industry lags in the early adoption of technology,[5] and the critical question of *implementation* overrides any of the promised benefits that such technology offers.

Considerable work has been done on the topic of implementing machine learning, but relatively little addresses the unique context of a law firm. Law firms stand apart from both traditional businesses and other professions in important

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[1] Machine learning may be defined as computer algorithms that have the ability to learn, in a functional sense, or improve in task performance over time. For a discussion of machine learning, see Harry Surden, *Machine Learning and Law*, 89 WASH. L. REV. 87 (2014).

[2] Vijay Pande, *Artificial Intelligence's 'Black Box' Is Nothing to Fear*, N.Y. TIMES (Jan. 25, 2018), https://www.nytimes.com/2018/01/25/opinion/artificial-intelligence-black-box.html.

[3] KIMBERLY NEVALA, THE MACHINE LEARNING PRIMER 23 (2017), https://www.sas.com/content/dam/SAS/en_us/doc/whitepaper1/machine-learning-primer-108796.pdf.

[4] There is the further question of how this information impacts client expectations, but that question lies beyond the scope of this particular paper.

[5] For a discussion of the reasons underlying the hesitancy to adopt legal technology, see *Selling Innovation to Law Firms*, THE PRACTICE (Jan. 2015), https://thepractice.law.harvard.edu/article/selling-innovation/.

ways (look no further than the fact that increased efficiencies gained by technology may equate to less time spent—or less billings—on a matter and ultimately fewer profits).[6]

With this distinctiveness in mind, I discuss some best practices for adopting machine learning with a specific focus upon the legal industry. In doing so, I draw upon the work of Kimberly Nevala, whose primer on machine learning illuminates several best practices and considerations for businesses.[7] Using these as a starting point, I synthesize several points and apply them to the unique law firm context. These points fall into three distinct categories: The Technology Team, The Data, and The Law Firm.

II. The Technology Team

The successful implementation of machine learning in law firms requires not just exceptional technology, but the exceptional interpretation of that technology and application to legal practice. As Nevala astutely notes, "[s]uccessful organizations have the analytic infrastructure, expertise and close collaboration between analytics and business subject matter experts."[8] As such, finding a knowledgeable data scientist or technology firm is just the beginning.[9] At least two other roles are necessary to effectively implement machine learning—the subject matter expert and the chief knowledge officer.[10]

A. Subject Matter Expert

The technology firm providing the machine learning platform should complement their data science team with subject matter experts in the particular business context in which the platform is being applied.[11] Put simply, a law firm should expect their tech provider to have an attorney on their staff whose *sole* responsibility is to interface between the law firm and the technology.[12] In that vein, the technology provider must endeavor to understand the firm's guiding analytical concerns and questions, assist them with the organization and "munging" of the law firm's data, and translating between the data science team and the law firm leaders.[13]

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[6] *Id.*

[7] Nevala, *supra* note 4.

[8] *Id*. at 30.

[9] *Id.* at 34.

[10] *See* O'Grady, Jean P. *Knowing Value: The Rise of the Law Firm Chief Knowledge Officer*, Prac. Innovations (Oct. 2017), http://static.legalsolutions.thomsonreuters.com/static/images/news-letters/ pracinno/Oct17_PracticeInnovations.pdf.

[11] *See* Nevala, *supra* note 4.

[12] *See* O'Grady, *supra* note 11.

[13] *See* Geoff Boushey, *Data Munging with Python, SQL, and Excel*, We Wrote This (Sept. 27, 2016), https://blogs.library.ucsf.edu/ckm/2016/09/27/data-munging-with-python-sql-and-excel/. The

Ideally, the legal subject matter expert should be more than just an experienced attorney, but rather an attorney who has also worked in Big Law and has additional training in technology and innovation.[14] Given the aforementioned mystery surrounding the true innerworkings of some aspects of machine learning, such an individual can play a vital role in not only ensuring the effective analysis of data, but also the explanation of the *underlying meaning* of the data and the management of mutual expectations of all involved.

B. Chief Knowledge Officer [15]

Law firms have begun to realize the importance of managing their vast troves of data and knowledge, and in response have developed professional teams devoted to their management and analysis.[16] At the helm of such teams is the chief knowledge officer, who attempts to preserve and utilize all available firm data to enhance the effectiveness of a law firm's practice.[17]

A chief knowledge officer provides the technology team with principal questions of interest that guide the application of machine learning.[18] She also cleans, organizes, and provides the necessary data for analysis, and acts as the primary interface between the technology team and the practicing attorneys with whom she works.[19]

Although a veritable army of individuals may work to support the successful implementation of machine learning in law, the subject matter expert on the technology side and the chief knowledge officer on the law side play essential roles in determining an effective long-term engagement.[20]

III. THE DATA

The sheer volume of data that law firms now compile is matched only by that data's growing complexity.[21] Law firm data is often messy because, in addition to

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term "munging" may informally refer to the transformation of raw "messy" data into a more useable, digestible format. *Id.*

[14] Assuming that the client is a medium to large law firm, as is most often the case with the current adoption of machine learning platforms.

[15] This particular title is highlighted here for simplicity, but the role described herein may be played by individuals holding a wide array of titles, such as Chief Technology Officer, Information Technology Manager, etc. In addition, such experts may hold no formal title at all, but may simply be the default technical expert of the firm.

[16] *See* O'Grady, *supra* note 11.

[17] *Id.*

[18] *Id.*

[19] *Id.*

[20] Nevala, *supra* note 4.

[21] Mary E. Egan, *Law Librarian? Try Chief Knowledge Officer; Our Annual Survey Shows That in an Era of Digital Change, the Job of Law Librarian is Evolving Rapidly*, THE AM. LAWYER (June 30, 2017, 9:33 AM) (quoting American Association of Law Librarians' President Greg Lambert, "[i] think firms are understanding that we have more information at our disposal than ever before").

traditional numerical data, there exist vast amounts of qualitative data that must be organized and translated into a format comparable with machine learning platforms.[22] The quantity, quality, and nature of data often play an equally critical role in the success of a machine learning platform.[23] With this in mind, two key practices bear noting.

A. Data Standards

First time initiates to machine learning often feel reservations about the quality of their data.[24] Yet, as Nevala notes, "developing a functioning machine learning system is an iterative process that is part art and a lot of science."[25] While intuition would suggest that larger, cleaner data sets are always better, the real key is whether the data is adequate to address (1) the guiding question of interest, and (2) the power and complexity of the algorithm underlying the platform.[26] These two considerations are best determined through the thoughtful interaction between critical players highlighted in the prior section on a case-by-case basis.[27] Ultimately, regardless of the size, complexity, or technological adroitness of a law firm, knowledge managers should feel confident approaching the use of machine learning because nearly every meaningful application of such technology is bespoke.[28]

B. Data Strategy

Law firms must develop a strategy for collecting and organizing data. This statement would be an oversimplified truism if uttered in any field other than law, but many in the legal field continue to resist a full-scale data strategy.[29] Successful data strategies include detailed considerations of data storage, organization, and security.[30] The details underlying such considerations are beyond the scope of this précis, but one of the key elements is the manner in which such data is compiled.[31]

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[22] Agin, Warren E., *A Simple Guide to Machine Learning*, AM. BAR ASS'N. (Feb. 2017), https://www.americanbar.org/publications/blt/2017/02/07_agin.html.

[23] See Nevala, *supra* note 4, at 26 for a discussion of the relationship between complicated and clean data.

[24] *Id.*

[25] *Id.* at 25.

[26] *Id.*

[27] *Id.* at 28.

[28] *Id.*

[29] Karl G. Nelson & Michael D.Y. Sukenik, *Law Firms and Cyber Security: A Titanic Risk*, INTERNET LAW & STRATEGY (Aug. 2012), https://www.gibsondunn.com/wp-content/uploads/documents/publications/NelsonSukenik-LawFirmsandCyberSecurity.pdf ("[i]mportantly, while law firms are now squarely on hackers' radar[s], lawyers have been slow in some cases to appreciate the significance of the threat posed by cybercrime to their practices").

[30] *Id.*

[31] *Id.*

In short, one of the most critical aspects in effectively compiling useful data is to develop a data compilation strategy. This strategic element entails enlisting buy-in from lawyers on the need for such data, as well as how best to collect such information during the course of their normal practice.[32]

IV. THE LAW FIRM

Finally, and most importantly, the law firm itself must proactively prepare for the integration of machine learning.[33] Successful integration of high level technology requires a long-term commitment by all members of the law firm—they all stand to enjoy the benefits, but must also all align their strategy and behavior in order to ensure optimal results.[34] In this vein, firm-wide commitment must be enlisted for (1) the value of the concept, (2) the application of results, and (3) the continued collection of data.

A. Commitment to the Concept

Few attorneys enter the profession with the goal of practicing alongside artificial intelligence, and many may find the mere prospect of machine learning anathema to the staid profession of law.[35] Chief knowledge officers must anticipate that a firm's legal force runs the gamut of technological receptivity and attempt to foster firm-wide buy-in.[36] Doing so will require, at minimum, the following guiding principles.

1. Let Lawyers Make Sense of It

Machine learning platforms are excellent at distilling complex correlations and predicting outcomes, but often fail to provide the explanation for why such connections exist.[37] Engaging attorneys in the critical aspect of explaining the causation underlying such relationships integrates the practitioner with their technology in a fundamental way.[38] Nevala highlights the importance of telling the story that underlies the data, and utilizing practitioner expertise to do so engenders long-term commitment.[39]

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[32] *See* Sharon D. Nelson & John W. Simek, *Big Data: Big Pain or Big Gain for Lawyers?*, LAW PRACTICE MAGAZINE (Aug. 2013), https://www.americanbar.org/publications/law_practice_magazine/2013/july-august/hot-buttons.html.

[33] *See generally* Surden, *supra* note 2.

[34] *Cf. id.*

[35] *See* Nelson and Sukenik, *supra* note 30.

[36] Nevala, *supra* note 4.

[37] Surden, *supra* note 2.

[38] *Id.* for general discussion of capacity of machine learning; s*ee also* Nevala *supra*, note 4, at 32, in which she astutely notes the difference between prediction and causation.

[39] *See* Nevala, *supra* note 4, at 41.

2. *Guide Process with Clear Questions*

Effective use of machine learning requires clear, guiding questions at the outset—ideally developed by legal practitioners.[40] Armed with exquisite technology, users often feel the urge to experiment randomly with data analysis in order to see what comes up.[41] Unfortunately, such experimentation can not only lead to spurious conclusions, but also stymie buy-in efforts by creating the image of a technological hammer looking for a nail.[42] Guiding analysis with discrete functional questions of interest developed in connection with practitioners goes a long way toward enlisting buy-in.[43]

B. *Commitment to Application*

The optimal usage of machine learning platforms involves a balance between human and machine—adept attorneys utilizing the technology to augment and reinforce their decision-making. Put differently, Surden notes that machine learning formalizes "statistically to some extent what lawyers often do intuitively."[44] While in theory this may sound simple, it requires a great deal of consideration by attorneys on how they will apply this to their practice.

Of the many issues at stake, attorneys must determine the extent to which they will use such analytics in their decision-making as well as their client management. What happens when the analysis runs contrary to their intuition, and how do they use the analytics to manage client expectations? The answers to these questions are as difficult as they are varied, but the only way in which to truly enjoy and gauge the success of their machine learning programs is to develop a uniform commitment as to the manner in which the technology is applied.

C. *Commitment to Data Collection*

Related to the above point, practitioners must make a commitment to continuous and robust data collection. This point takes on special importance in the legal environment because while legal information has historically always *accumulated* in law firms, it has not always been strategically collected. In order to strategically collect data, the behaviors of attorneys (and paralegals) may have to change in order gather the data needed to make the most of machine learning. Even if no additional data needs to be collected from clients, there are likely ways in which legal professionals can record and organize their data to enhance the effectiveness of their technology. Much akin to the questions surrounding application of this

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[40] *See* Nevala, *supra* note 4, at 34.
[41] *Id.* at 36.
[42] *Id.* at 38.
[43] *Id.* at 34.
[44] *See* Surden, *supra* note 39, at 104.

technology, the questions regarding data collection vary widely, but warrant sincere attention by law firms reflected in the development of agreed-upon, firm-wide data collection policies.

V. CONCLUSION

This précis presents a brief framework of best practices and general considerations to guide the effective implementation of machine learning in law firms. Each section of this abridged sampling warrants substantially more discussion and will likely fill volumes to come. The legal industry currently finds itself in the transitional phase with respect to machine learning technology, and the foregoing provides key guideposts for approaching the adoption of machine learning from the prospect of the technology team, the nature of the data, and the law firm itself.