
TOWARD A NEW LANGUAGE OF LEGAL DRAFTING

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Abstract

Lawyers should write in document markup language just like web developers, digital publishers, scientists, and almost everyone else.

Keywords: legal drafting, contracts, document markup language, XML, HTML, LaTeX

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1. The Problem

1.1. What got me thinking

A common experience of being a lawyer that you don't think much about process improvement or product design. The key focus for many lawyers is meeting client needs as quickly as possible and billable hour targets. Having been a transactional lawyer for several years, I had never thought of drafting contracts in anything other than Microsoft Word.

When I started my LLM I met math and engineering students, who were involved in various forms of data analytics, machine learning and natural language processing. They showed me their projects and the software tools they were using. I realized that in other disciplines, people are adept at switching between the languages of math, coding or natural language, often within a single document, in order to use the tool best adapted to the task at hand.

Taking classes in design, technology and law, I began to think about the potential for changing how we generate and access legal content. I began to reflect on how we access content in various forms through technology, and how far the design and accessibility of legal content lags behind what we now take for granted everywhere else. This paper explores the thought that there is an enormous potential functionality that can be added to legal content if lawyers make modest efforts to add machine readable structure to their drafting. Lawyers would enjoy learning new skills, and clients and lawyers alike would be excited to discover how the way they produce and access legal content could be transformed.

This paper discusses what authoring in a markup language might look like, some of the advantages that this could have, and some of the barriers to implementation. A related question is what it would take to shift lawyer behavior to this style of writing, and what transitional steps might be appropriate. This could be the subject of further work.

1.2. *How lawyers draft and publish contracts*

Lawyers draft documents in word processors that focus on formatting and final appearance, usually Microsoft Word. Their documents are almost universally accessible and editable by the lawyer's clients, the other side and the courts. Following initial preparation by a lawyer, a draft contract may be emailed back and forth many times, with the parties making and tracking various changes.

Once the parties agree the terms, a junior associate tidies up the formatting of the document, prints it out and walks around town getting it signed. If you're super modern, you might do electronic signatures. Then the associate makes a pdf, emails it around and everyone uses that or the final word document for ever after as the record of the deal struck.

1.3. *Why this is a problem*

The output of legal drafting as it is done now and has been done in the past is unstructured natural language, poorly adapted for computational use and analysis. This is a problem because:

- Outside law, clients and lawyers are used to accessing and editing content in much more user friendly formats.¹ They use web based platforms that look great, allow easy navigation and transformation of content presentation according to the user's needs.² They can do this because the content has embedded structures readable by computers.³

¹ See Vincent Cho, *A study of the roles of trusts and risks in information-oriented online legal services using an integrated model*, 43 INFO. & MGMT. 502, 507 (2006) (discussing how user-friendly platforms attract more users).

² See *id.* (listing the benefits associated with using the PEOU method).

³ See Stephan Wong et al., *Embedded Processors: Characteristics and Trends*, DELFT UNIVERSITY OF TECHNOLOGY, available at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.4.18&rep=rep1&type=pdf> (illustrating how embedded processors enables more computer capability).

- Sharing and editing content using traditional word processors is cumbersome compared to tools used to create, edit and share digital content outside law.⁴ GitHub and similar tools used by coders offer greater flexibility and functionality.⁵ There are significant productivity and user experience costs to keeping outdated tools just because they have become familiar and something of an industry standard in law.⁶
- Contracts are poorly integrated into other business and data management systems, and companies don't know enough about the contracts they have entered into.⁷ As Nick West of Axiom has noted "very few general counsel can tell you the number of contracts their company is party to, let alone understand the totality of their obligations, the interactions between them or their organizational risk implications."⁸
- Lawyers aren't managing their knowledge and experience effectively.⁹ A significant part of the practice of law is drawing on experience and knowledge gained from previous transactions and

⁴ See *Collaborative Writing*, WEB2PRACTICE, archived at <https://perma.cc/V2A6-VACQ> (collaborating amongst co-authors allows dynamic work product when utilizing multi-author web tools).

⁵ See, e.g., Joseph Feliciano, *Towards a Collaborative Learning Platform: The Use of GitHub in Computer Science and Software Engineering Courses* (Aug. 31, 2015) (unpublished Master of Computer Science thesis, University of Victoria) (on file with the University of Victoria Library system) (encouraging collaborative workflow using GitHub through flexible features); see also *Frequently Asked Questions*, SPRYKER, archived at <https://perma.cc/67BQ-LA5Y> (supplying IT users a streamlined approach to development of complex technology challenges).

⁶ See, e.g., Mary Juetten, *Examining Legal Tech Adoption, Part I*, LAW TECHNOLOGY TODAY (Sept. 28, 2015), archived at <https://perma.cc/X826-HJE9> (discussing legal community's resistance to change in technology).

⁷ See Nick West, *Getting to Grips with Corporate Contracts*, THE LAWYER (May 26, 2015), archived at <https://perma.cc/JS34-8AM4> (discussing risks that companies face due to the inefficient and disorganized manner of current contract formation processes).

⁸ See *id.* (illustrating the lack of knowledge companies have about their own contracts).

⁹ See Andrea Kupfer Schneider, *Perception, Reputation and Reality: An Empirical Study of Negotiation Skills*, DISPUTE RESOLUTION MAGAZINE, Summer 2000, at 28 (discussing Williams Study of 1976). The Williams Study of 1976 analyzed the effectiveness of lawyers in negotiations. *Id.*

documents.¹⁰ Legal drafting often involves a lawyer taking a moderately well-structured precedent and customizing it into an unstructured or “flattened” form.¹¹ It is hard to force the output back into the knowledge management system.¹² In most cases the lawyer doesn’t bother, which affects both the quality and efficiency of future work.¹³

•While machine learning and natural language processing techniques are improving, the ability to undertake computational analysis of legal documents is significantly complicated by their lack of structure.¹⁴ If the lawyer is conscientious in how they use their firm styles it may be possible to parse a basic structure out of legal document and identify what are section headings, defined terms, legislation, case names, etc.¹⁵ But this is hard work and

¹⁰ Stephen J. Choi et al., *The Dynamics of Contract Evolution*, 88 N.Y.U. L. REV. 1, 3 (2013) (suggesting contract drafters are inventors, improving existing products to meet clients’ needs). The authors maintain that this is such a dominant aspect of drafting that contract drafters are more inventors than authors, testing existing products and attempting to improve them so that they can meet the clients’ needs at hand. *Id.*

¹¹ See James B. Minor, *The Fundamentals of Legal Drafting*, 44 TEX. L. REV. 588, 589 (1966) (discussing organization and arrangement of documents being drafted). For example, in the author’s own law firm, the precedents collection has a computer readable structure which allows modular clauses to be added or deleted, and for variables to be inserted.

¹² Philip D. Weller, *Drafting 1.01 (With Real Estate Examples and Resources): Be brief, be clear, and get to the point*, AMERICAN LAW INSTITUTE, archived at <https://perma.cc/H9K5-9JWV> (discussing the importance of prior precedent and knowledge when drafting legal documents).

¹³ See *id.* (discussing the negative effects that can occur after failing to draft a legal document well).

¹⁴ See H. James Wilson et al., *Companies are Reimagining Business Processes with Algorithms*, HARVARD BUSINESS REVIEW (Feb. 8, 2016), archived at <https://perma.cc/5T48-T7JX> (highlighting changes in businesses that would have been impossible without powerful, machine-learning algorithms); Scott Vanderbeck et al., *A Machine Learning Approach to Identifying Sections in Legal Briefs*, CEUR WORKSHOP PROCEEDINGS, archived at <https://perma.cc/4F9B-8XWL> (identifying a lack of structure as the key challenge in designing documents).

¹⁵ See John O. McGinnis & Russel G. Pearce, *Great Disruption: How Machine Intelligence Will Transform the Role of Lawyers in Delivery of Legal Services*, 82 FORDHAM L. REV. 3041, 3042 (2014) (describing automation of attorney’s routine legal task by machines).

unreliable.¹⁶ It would be much better to start with something structured.¹⁷

•An outdated approach to content generation and publishing is part of the legal industry's broader vulnerability to changes in technology and new legal business models.¹⁸ Clients are fed up with the traditional law firm.¹⁹ Lawyers cost too much and aren't productive enough.²⁰ Lawyers haven't looked outside law to see what's happening in the world.²¹ Lawyers need to learn some new tricks, and start to catch up with everyone else.²²

2. A Solution

2.1. Thinking about the roles that contracts perform

Lawyers author and publish contracts as if their only purpose is to be a permanent record of the parties' bargain, to be kept in safe

¹⁶ See *id.* (explaining that lawyers must adapt to machine learning to be efficient in delivering legal services). The article explains in detail the new challenges attorneys face with machine technology in creation of documents and that a smart machine will make the process easier for attorneys. *Id.* at 3041.

¹⁷ See Harry Surden, *Artificial Intelligence and the Law: Essay: Machine Learning and Law*, 89 WASH. L. REV. 87, 94 (2014) (discussing algorithms building models by detecting patterns to create a product based on pre-determined rules); see also Oanh Thi Tran et al., *Automated Reference Resolution in Legal Texts*, 22 ARTIFICIAL INTELLIGENCE & L. 29, 31 (2014) (relating natural language processing techniques to the law, while discussing this technique's accuracy levels and challenges).

¹⁸ See RICHARD SUSSKIND, *THE END OF LAWYERS? RETHINKING THE NATURE OF LEGAL SERVICES* 24 (2008) (discussing business and technological pressures affecting traditional law firm models).

¹⁹ See *id.* (characterizing clients as demanding better services from their lawyers at lower costs).

²⁰ See *id.* at 6 (discussing inefficiencies in the legal profession leading to client dissatisfaction).

²¹ See *id.* (criticizing lawyer's denial of efficiency in new practices and use of technology).

²² See *id.* at 6-7 (stressing need for change in the day-to-day practice of lawyers).

storage and dug out and presented to the court if absolutely necessary.²³

But many contracts are living documents that go through a period of evolution as they are drafted and negotiated, and then use and reuse after they are signed.²⁴

Contracts perform a number of roles, and have a variety of data and business knowledge embedded within them.²⁵ The roles of contracts include:

- A platform for negotiation and collaboration. Many commercial aspects of deals are conceived or refined through the formal process of reducing the parties' deal to contractual provisions.²⁶
- A store of information about the deal. This may appear in a contract in various forms, but may include classes of information such as monetary amounts, dates, references to external events, etc.²⁷
- A store of knowledge about the parties' businesses. A variety of business data may be embedded within a contract, from simple things like address and contact details, to more detailed commercial information such as insurance policies, business procedures (e.g. ways of making payments), etc.²⁸

²³ See *Formation of Contract Law*, 14C MASS. PRAC., SUMMARY OF BASIC LAW § 16.3 (4th ed.) (discussing general formation and purpose of contracts).

²⁴ See Iva Bozovic & Gillian Hadfield, *Scaffolding: Using Formal Contracts to Build Informal Relations to Support Innovation* 35 (Feb. 25, 2015) (unpublished paper) (on file with the selected works of Gillian K Hadfield) (elaborating on what "living" document means).

²⁵ See Alan Schwartz & Robert E. Scott, *Contract Theory and the Limits of Contract Law*, 113 YALE L.J. 541, 543 (2003) (describing the different roles contracts can take on in business transactions).

²⁶ See Ronald J. Gilson et al., *Text and Context: Contract Interpretation as Contract Design*, 100 CORNELL L. REV. 23, 26 (2014) (tracking the development of the parties' initial dealings into a formal contractual document).

²⁷ See Bozovic & Hadfield, *supra* note 24 at 1 (discussing the role of contracts as stores of information and as a tool for communication).

²⁸ See Thomas D. Barton et al., *Visualization: Seeing Contracts for What They Are, and What They Could Become*, 19 J. L. BUS. & ETHICS 47, 53 (2013) (identifying the range of business data within a contract).

- A store of knowledge about the law. Much of a lawyer's value comes from the experience of previous transactions. The content of contracts are a mineable resource for future deals.²⁹
- A reference for the court, should a dispute arise.³⁰

2.2. More functional contracts

Having regard to these different roles of contracts, it is worth considering whether the current approach to authoring and publishing contracts takes full advantage of available technologies to maximize their value and usefulness.³¹ Imagine content authored by lawyers being spun out seamlessly to clients, supervising partners and other parties in a form adapted to their needs and use. Only need to see one clause in a 200 page contract? See the clause, its history, edit it and send it around without wading through the rest.³² Your partner can

²⁹ See George G. Triantis, *Improving Contract Quality: Modularity, Technology, and Innovation in Contract Design*, 18 STAN. J.L. BUS. & FIN. 177, 186 (2013) (describing how previous transactions produce reusable data).

³⁰ See Jody S. Kraus & Robert E. Scott, *Contract Design and the Structure of Contractual Intent*, 84 N.Y.U. L. REV. 1023, 1028 (2009) (discussing contract adjudication by courts).

³¹ See Triantis, *supra* note 29, at 191-92 (analyzing technological advances for efficient contracts).

³² See Triantis, *supra* note 29, at 204-05 (discussing an example of how built-in modularity of contracts can be exploited); SUSSKIND, *supra* note 18, at 29 (describing how traditional legal practices may not produce the best results for a client); Armin Wittfoth et al., *AustLII's Point-in-Time legislation system: A generic PiT System for presenting legislation*, AUSTRALASIAN LEGAL INFORMATION INSTITUTE (Apr. 7, 2005), archived at <https://perma.cc/6XB4-T6GB> (noting functionality of online legislation resources facilitated by modular structure of legislation easily parsed and distributed amongst multiple applications); Armin Wittfoth et al., *Can one size fit all?: AustLII's point-in-time legislation project*, 6 UNIV. OF TECH. SYDNEY L. REV. 117, 127 (2004) (demonstrating how applications use collaborative authoring, tracking and commenting capabilities in user-centered design).

approve your clause amendments on their phone in a cafe just as easily as they can in the office.³³ We could see genuine collaboration between teams of lawyers and their clients in legal content creation.³⁴ Have suggested definitions and clauses appear as you draft.³⁵ Have the software check that you haven't defined a term then not used it, or vice versa.³⁶ Hover over terms and see their meaning, change histories, relationship to other parts of the document, or other documents.³⁷ Your document is effortlessly available as a precedent for later transactions.³⁸

This could be achieved within a software environment based on lawyers authoring in a document markup language like XML, HTML or LATEX, specifically adapted to law.³⁹ They should also take tools from the coder's toolbox like GitHub to help them share, edit and record change histories of documents.⁴⁰

This is not hard.⁴¹ Lawyers would need to produce content in a way unfamiliar to them now.⁴² But other professionals have been producing content in this way for years.⁴³

³³ See Adam W. Scoville, *Clear Signatures, Obscure Signs*, 17 CARDOZO ARTS & ENT. L.J. 345, 346-49 (1999) (discussing ability to utilize electronic signature approval).

³⁴ See Dennis Kennedy, et al., *Working Together on Your Own: Collaborative Technology and Cooperative Analytic Work Tools*, 27 GPSOLO 15, 16 (2010) (demonstrating legal collaboration through technology).

³⁵ See Triantis, *supra* note 29, at 191 (discussing the benefits that innovative software can provide lawyers with when drafting contracts).

³⁶ See Triantis, *supra* note 29, at 191 (illustrating the efficiency of using software to tag and categorize provisions in contracts).

³⁷ See Triantis, *supra* note 29, at 190 (outlining the usefulness of contract documents translated into operationally meaningful terms).

³⁸ See Triantis, *supra* note 29, at 191 (explaining the benefits of efficient document retrieval).

³⁹ See Robert Plotkins, *Electronic Court Filing: Past, Present, and Future*, 44 B.B.J. 4, 16-17 (2000) (articulating the benefits of XML formatting).

⁴⁰ See *Business Features*, GITHUB, archived at <https://perma.cc/W49J-A2XC> (showing the benefits of code collaboration).

⁴¹ See Plotkins, *supra* note 39, at 17 (discussing the ease of transition to XML processing system).

⁴² See *id.* (clarifying that lawyers would not need to stop using their favorite word processors all together).

⁴³ See Robert Craig Waters, *The World Wide Web and E-Filing in Florida*, 81-APR FLA. B.J. 34, 35 (2007) (acknowledging the use of XMLs by professionals).

3. What This Could Look Like

3.1. Key elements

Technology elements of this solution might be:

- Pre-defined tags, which will enable the content to populate a relational database.⁴⁴ These tags would need to be applied in a standard way by all users of the system.⁴⁵

Permitted disclosure of Confidential Information

The parties must not disclose Confidential Information, unless:

- (a) required by the Corporations Act section 87 or any other Law;
- (b) to a Prospective Investor; or
- (c) in accordance with clause 19.

Figure 1: Example clause

- An assisting interface in which lawyers can author content in a markup language (basically a text editor with additional features).⁴⁶ The assisting interface might look like Sublime or Python IDLE.⁴⁷ The markup language might look like XML, using the pre-defined tags.⁴⁸
- A web-based app which users can log into, to see a contract workflow customized to them.⁴⁹ This would include version and

⁴⁴ See Lawrence A. Cunningham, *Language, Deals, and Standards: The Future of XML Contracts*, 84 WASH. U. L. REV. 313, 337 (2006) (summarizing the use of XML databases).

⁴⁵ See *id.* (acknowledging XML's ability to be updated automatically).

⁴⁶ See Andrew S. Friedberg, *Traditional Transactions in a Virtual World*, 72 TEX. B.J. 534, 536 (2009) (highlighting XML's future potential in the legal profession).

⁴⁷ See *Applications*, PYTHON, <https://perma.cc/4438-H27X> (providing and listing examples of different Python applications, software, and learning tools).

⁴⁸ See Friedberg, *supra* note 46 (indicating XML use as markup language).

⁴⁹ See Cunningham, *supra* note 44, at 317-18 (arguing current XML limitations).

changes control, allowing control of edits and tracking of the history of a document.⁵⁰ Similar to GitHub, but with appropriate privacy and security to suit the requirements of law.⁵¹

- A database management system to manage the information collected, to allow its redeployment in various forms.⁵²

The first two of these elements are discussed in sections 3.2 and 3.3 below.

3.2. Authoring in a legal markup language

Figure 1 is an example contract clause.⁵³ Figure 2 shows how this clause might be written in a markup language.⁵⁴ Let's consider some examples of what we could achieve by writing in a markup language like this.⁵⁵ In this example, we have used a backslash to indicate a tag.⁵⁶ The tags would be predefined and computer readable.⁵⁷ Tags used here are for illustrative purposes only. Table 1 describes how each tag in this example clause could be used.⁵⁸

⁵⁰ See Cunningham, *supra* note 44, at 337 (describing the simplified process of using automation while editing contracts).

⁵¹ See Cunningham, *supra* note 44, at 354 (highlighting the use of technology by lawyers as a risk).

⁵² See Karehka Ramey, *What is Management Information Systems – And it's Use in Decision Making?* USE OF TECHNOLOGY (Dec. 20, 2013), archived at <https://perma.cc/4KXH-CYUC> (discussing various uses of information systems in small businesses and organizations).

⁵³ See Go Eguchi & Laurence L. Leff, *Rule-based XML: Rules about XML in XML to Support Litigation Regarding Contracts*, 10 ARTIFICIAL INTELLIGENCE & L. 283, 285 (2002) (delineating an example contract clause in XML).

⁵⁴ See Eguchi & Leff, *supra* note 53, at 285 (explaining many ways in which information can be marked-up in the legal context); Cunningham, *supra* note 44, at 316-17 (discussing the details of possible uses of XML to markup legal documents).

⁵⁵ See Cunningham, *supra* note 44, at 317 (discussing “markup language” and how computers follow instructions created by the author to obtain a finished product).

⁵⁶ See Cunningham, *supra* note 44, at 318 (describing different types of symbols that can be used as tags).

⁵⁷ See Cunningham, *supra* note 44, at 318 (providing examples of “predefined” text sections used as tags).

⁵⁸ See Cunningham, *supra* note 44, at 317-18 (offering examples of tags used in other formats).

Many more options are possible, depending on user needs.⁵⁹ For example, a law firm may be responsible for producing and administering many hundreds of contracts of similar type for a single enterprise.⁶⁰ These may have consistent

```
\section[\type{Confidentiality}]{Permitted disclosure of \def{
Confidential Information}}

The parties must not disclose \def{Confidential Information}, unless:

\begin{itemize}
\item required by the \leg{Corporations Act section 87} or any other \def{
Law};
\item to a \def{Prospective Investor}; \or
\item in accordance with clause \ref{Dispute Resolution}.
\end{itemize}
```

Figure 2: Example clause with markup

```
\section[\type{Confidentiality}]{Permitted disclosure of \def{
Confidential Information}}

The parties must not disclose \def{Confidential Information}, unless:

\begin{itemize}
\item required by the \leg{Corporations Act section 87} or any other \def{
Law};
\item to a \def{Prospective Investor}; \or
\item in accordance with clause \ref{Dispute Resolution}.
\end{itemize}
```

Figure 3: How a software interface can refer the author to other elements in their document, as they type

Tag	Description
\section	Labeling sections of a contract. To allow reliable indexing of sections

⁵⁹ See V. Mary Abraham, *Moving Beyond KM for Dogs*, LEGAL IT TODAY, June 2013, at 30 (contemplating automated environments that are smart enough to deliver “at the moment of need the relevant precedents, practice notes, drafting templates and writing guidance, as well as pertinent information from the client file”).

⁶⁰ See Cunningham, *supra* note 44, at 329 (explaining the simple variations law firms use in production of standard contracts).

	for uses including navigation, redeployment in other formats and later analysis. It is easy to do a hierarchy of sections to align with your style sheet, e.g. <code>\subsection</code> , <code>\subsubsection</code> , etc.
<code>\type</code>	Labels for content categories. You can add content to predetermined content categories (such as “Confidentiality” clauses) but not show this label in the published form
<code>\def</code>	Tagging definitions. Authoring software can check you have actually defined the term you are tagging as a definition, as shown in a screenshot of Sublime, shown in Figure 3. When you publish, you can have functionality such as being able to hover over defined terms throughout a contract and have their definition appear.
<code>\leg</code>	Tagging legislation or case names. This could have many functions, including: forcing references into a standard format (i.e. “firm style”); allowing later analysis of references to legislation across documents; or more sophisticated functions like cross-checking with legislative or databases to inform the drafter of relevant information such as when the section they are referring to was last amended or how a case has been treated.
<code>\itemize</code>	Tagging lists. While this might be done purely to tell the software to format the text using a list style, it has other potential applications. For example you could automatically

	recall items that are listed in Confidentiality clauses in your documents (e.g., find that 90% of agreements of a certain type refer to the same 10 items).
\or	Tagging simple operators, such as “and”, “or”. This could help later analysis of the context of lists. You might be also able to tag logical operators such as “if”, “then” and “else”, for later analysis. Operators like this could encourage lawyers to adopt more standard drafting styles. For example, the software might not compile or show errors if a document that has incorrectly structured or missing logical operators. All of this works towards legal drafting that is increasingly amenable to computational analysis and transformation.

Table 1: Description of tags used in Figure 2

variables such as payment dates, payment calculations, jurisdiction, party details such as addresses, etc.⁶¹ A markup language would allow tagging of these variables to facilitate communication to relevant business units in their desired format (e.g., a payment schedule).⁶² Substantial efficiencies can be gained by entering data only once.⁶³

⁶¹ See Cunningham, *supra* note 44, at 329 (providing specific examples of different types of variables in different contract forms).

⁶² See Winchel “Todd” Vincent, III, *XML and the Legal Foundations for Electronic Commerce: Legal XML and Standards for the Legal Industry*, 53 SMU L. REV. 1395, 1397 (2000) (discussing a wide variety of uses XML can provide for users).

⁶³ See Kuang Chen, et al., *Designing Adaptive Feedback for Improved Data Entry Accuracy*, REPRESENT, archived at <https://perma.cc/X4JH-TWR6> (explaining accuracies and efficiencies that can be improved through data input).

An example of how this could be applied is to the initial contractual documentation for startups.⁶⁴

Funding arrangements for startups are typically explored using a waterfall or cap table in Microsoft Excel or specialized software applications,⁶⁵ where different outcomes are modeled and scenarios tested as variables are adjusted.⁶⁶ The output from this then informs term sheet generation.⁶⁷ Startup term sheets typically have a relatively standard and modular form⁶⁸ and a number of variables which come directly from the initial waterfall or cap table (e.g., holder names, participation, valuations, discounts, dividends, liquidation preferences, etc.).⁶⁹ Having a structured term sheet template would allow variables from the waterfall or cap table to be filled automatically, and the same can be applied to later formal contract generation.⁷⁰ It would save time and increase the accuracy of term sheet and contract generation if data could be integrated across these steps.⁷¹

Structuring content in this way opens up many opportunities for manipulation that would not otherwise be possible,⁷² or would be

⁶⁴ See 7 *Legal Documents for Your Tech Startup*, STARTUP LAWYER (Nov. 5, 2008), archived at <https://perma.cc/C5CZ-J92A> (listing common legal documents for startups); see also Marc Lauritsen, *Lawyering in an Age of Intelligent Machines*, in EDUCATING THE DIGITAL LAWYER (Oliver Goodenough & Marc Lauritsen eds., 2012) (describing how technology can assist corporate law departments to create their own forms).

⁶⁵ See Jeron Paul, *What is the best cap table template available online?*, QUORA, archived at <https://perma.cc/R4M3-NFJ7> (providing an example for the description and screenshots of waterfall and cap tables).

⁶⁶ See *id.* (analyzing percentage dilutions for different exit scenarios).

⁶⁷ See *WSGR Term Sheet Generator*, WILSON SONSINI GOODRICH & ROSATI, archived at <https://perma.cc/6FUR-AL4Y> (displaying a fairly expansive and innovative generating tool).

⁶⁸ See *id.* (acknowledging general terms that typically comprise of a term sheet). This modularity has been exploited by some law firms that offer online automatic term sheet generation, such as Cooley and Wilson Sonsini. *Id.*

⁶⁹ See Paul, *supra* note 65 (listing output components of the waterfall analysis).

⁷⁰ See *Capitalization Table*, INVESTOPEDIA, archived at <https://perma.cc/TU6Y-XRPE> (showing how capitalization tables can be filled automatically and then transferred into a formal contract).

⁷¹ See *id.* (presenting the common structure of a capitalization table for startups).

⁷² See Triantis, *supra* note 29, at 190-91 (discussing current applications of this in contract management software); see also Akos Szoke et al., *Versioned linking of*

more difficult and less reliable without a consistent computer readable structure.⁷³ This would also free lawyers from worrying about the appearance of their legal documents.⁷⁴ Traditional word processors are preoccupied with visual formatting, which is not relevant to legal interpretation.⁷⁵

semantic enrichment of legal documents, 21 ARTIFICIAL INTELLIGENCE & L. 485, 494-95 (2013) (explaining the structure and creation of an automated legal document). This paper defines three levels of structure for legal documents: document standardization, conceptual modeling and logical modeling. *Id.* We are proposing something similar to first level, being document standardization. Szoke describes the functionalities of this level as being: enabling semantic search, versioning, translatability, interchangeability, integrability and referencability. *Id.*

⁷³ See Harry Surden, *Structuring US Law*, CONCURRING OPINIONS (May 7, 2015), archived at <https://perma.cc/C22W-KTYP> (describing the difficulty for computers in processing unstructured law).

⁷⁴ See *id.* (comparing how a computer reads legal documents as opposed to a human).

⁷⁵ See Vincent, *supra* note 62, at 1399 (highlighting that firms have strict stylesheets, which can be easily applied to documents produced in a consistent markup language).

3.3. Sharing content like a coder

A further requirement is a tool to manage versions and changes to legal documents.⁷⁶

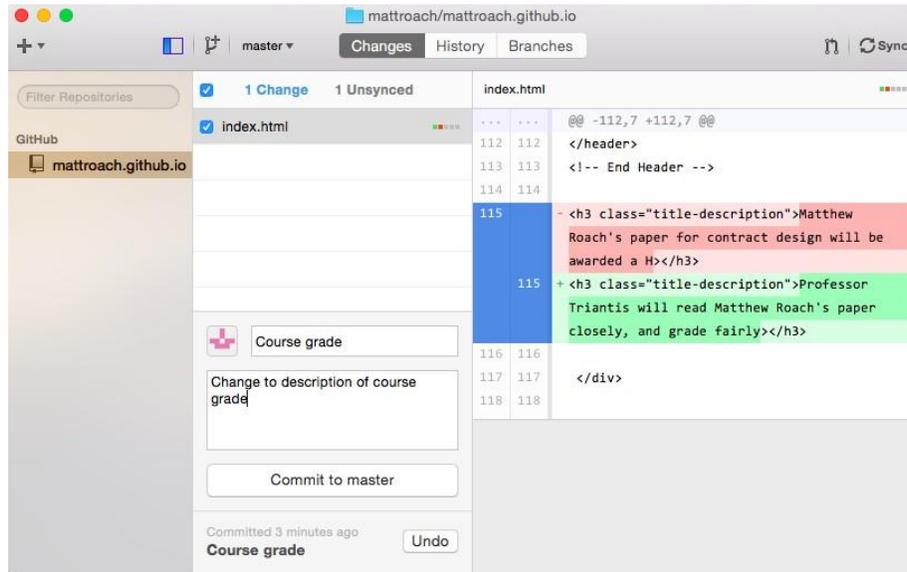


Figure 4: Example of a change to a HTML document tracked by GitHub

Coders are familiar with lengthy and complex documents produced and shared by teams, where tracking the history of changes is critical.⁷⁷ Coders have produced better tools to do this than lawyers currently use.⁷⁸

⁷⁶ See *id.* (describing how this tool can be used to change legal documents and databases).

⁷⁷ See Daniel Bulygin, *7 Free Easy-to-Use Online Collaboration Tools - Make Teamwork Simple*, TRENDLOG (Apr. 4, 2016), archived at <https://perma.cc/CJ3Z-BL4G> (discussing options for document sharing amongst software developers).

⁷⁸ See *id.* (listing online collaboration tools which coders have been able to use effectively and that lawyers could adapt); see also Ali Watkins, *Life is Complicated for Most Lawyers Who Handle Classified Info*, THE HUFFINGTON POST (Sept. 4, 2015), archived at <https://perma.cc/LDG2-NT5D> (highlighting the difficulties with archaic technologies for business practice).

Figure 4 is an example of how this looks like on the GitHub platform (red is deleted text, green is new text), with an edit made to a HTML document.⁷⁹ Changes are identified by time and author, and can be reviewed and annotated by groups.⁸⁰ Change history is always retained.⁸¹

3.4. *What it could look like in practice: construction contracts*

This section considers how the solution might be applied to construction contracts. Construction contracts exhibit very strong modularization, and because of the prevalence of standard forms, a high level of standardization in content.⁸² Key types of clauses in a construction contract include:

- Site access
- Performance security
- Design
- Site conditions
- Programming
- Extensions of time
- Payment
- Safety requirements and WHS
- Environmental requirements
- Completion and handover⁸³

⁷⁹ See Ben Balter, *Diff (and collaborate on) Microsoft Word Documents Using GitHub*, BEN BALTER (Feb. 6, 2015), archived at <https://perma.cc/7VWP-WRMH> (illustrating deletion and addition functions in GitHub).

⁸⁰ See *id.* (showing an example of how changes are identified by author name and time of change).

⁸¹ See *id.* (describing saved changes in GitHub).

⁸² See John Sharkey et al., *Standard Forms of Contract in the Australian Construction Industry*, The University of Melbourne (June 2014) archived at <https://perma.cc/TD2C-8WH9> (citing 68 percent of construction contracts reported upon used standard forms).

⁸³ See *id.* at 42 (listing common contract amendments from standard forms).

It is possible to see from this list how authoring in a computer readable form could facilitate collaboration between lawyers and their clients through allowing identification of relevant business units for each clause or section of the contract, and dissemination and exchange of information between external lawyers, internal lawyers and business units.⁸⁴

Information relevant to these contractual provisions may be held by clients in different forms of data, and analyzed by them using different software programs.⁸⁵ Clients may model and runs scenarios on data which is then fed into the contract.⁸⁶ A change to one part of the business position as set out in the contract may trigger a reassessment of other parts.⁸⁷ Authoring contracts in a computer readable form offers the potential to allow relevant data to be maintained in a single repository to provide a source of data for different software applications, updated across all of them automatically.⁸⁸

An example process for a contract might look something like this:

- After receiving instructions from commercial managers, and perhaps following discussion with their external lawyers, an internal lawyer chooses the initial contract form from a precedent collection.
- The lawyer identifies modules and sections relevant to different business groups (e.g., workplace health and safety, environment, insurance, accounting, etc.), and sets up a web-based workflow where the relevant components of the contract are sent out to the relevant people.

⁸⁴ See *id.* (allowing for efficient use of computer readable contract techniques with Australian construction contracts).

⁸⁵ See Triantis, *supra* note 29, at 190-91 (advocating the use of multiple software programs to analyze different provisions of contracts). For example, financial data is kept and analyzed differently to construction programming data. See Sharkey et al., *supra* note 82, at 42 (identifying contract provisions analyzed by different departments).

⁸⁶ See Triantis, *supra* note 29, at 186 (addressing client contract data supplied electronically).

⁸⁷ See Sharkey et al., *supra* note 82, at 52 (identifying possible outcomes of contract amendments).

⁸⁸ See Harry Surden, *Computable Contracts*, 46 U.C. DAVIS L. REV. 629, 670 (2012) (discussing contractual clauses stored and maintained for efficiency).

- Each business unit adds in the information relevant to them, and makes such amendments to the clause as they see fit. They might also use commenting to request that the lawyers draft other amendments to achieve specific business outcomes.
- The modular format of the contract and the web-based workflow means that there can be an iterative process of reviewing and amending contract clauses before the contract is finalized.⁸⁹ Having an underlying computer readable structure could facilitate great flexibility in how this process could occur.⁹⁰ It could improve productivity, and improve client satisfaction with the outcomes of the contract drafting process.⁹¹ Concepts that have proved successful in helping people interact in other platforms could be used here. Imagine approval of a particular clause amendment being communicated by a “like” button.

The pressing need for change in work processes in contract development and negotiation is illustrated by a University of Melbourne study on contracts.⁹² Their surveys revealed the following client views of lawyer involvement:

- Changes are driven by lawyers rather than their clients; when clients are apprised of the effects of the changes suggested by their lawyers...they often say that they do not want the changes to be made.
- Lawyers often have a poor understanding of the technical and commercial implications of their amendments, such as in advising upon contract- specific issues for insertion into the Annexure (contract particulars).⁹³

⁸⁹ See Triantis, *supra* note 29, at 181 (highlighting the ease of implementing customizable contracts due to modularity).

⁹⁰ See Surden, *supra* note 88, at 648 (addressing the options of data oriented approaches to contracting).

⁹¹ See Triantis, *supra* note 29, at 186 (describing cost-saving and other benefits to clients through legal technological innovation).

⁹² See Sharkey et al., *supra* note 82, at 42 (identifying cost and time inefficiencies with current contract amendment processes).

⁹³ See Sharkey et al., *supra* note 82, at 42 (considering the complexity of contractual negotiations involving attorneys without complete understanding of amendment implications).

The collaborative approach to contract drafting proposed here could address issues such as these by enabling input of relevant data by those most appropriately positioned to do so.⁹⁴ It also gives the ability to comment and iterate the developing contract more rapidly.⁹⁵ It should also help the lawyers demonstrate their value to the client, as the lawyers will spend less time transferring and translating the business objectives into contractual form, and more time sharing insights and legal advice on the contract.⁹⁶

This vision of a web-based workflow contrasts sharply with the current approach to drafting in traditional word processors.⁹⁷ For example, in a traditional word processor, the format and style encourages a mode of working where the whole contract has to go back and forth (lawyer to client, or to the other side), with very little ability to deal with modules of the contract separately.⁹⁸

A further potential application is the ability to directly link metrics of contract success back to clauses of the contract.⁹⁹ For example, you could have the authoring software report reports as you draft a clause such metrics as:

- The average time taken to negotiate this clause.
- Description of changes made to the standard precedent clause in past transactions.

⁹⁴ See Sharkey et al., *supra* note 82, at 7 (illustrating a simplistic way of contracting that avoids confusion among parties).

⁹⁵ See Daniel Markovits, *Contract and Collaboration*, 113 YALE L.J. 1417, 1456 (2004) (explaining that parties engaged in contracts can utilize one another in pursuing contract goals).

⁹⁶ See Heidi K. Gardner, *When and Why Clients Want You to Collaborate*, THE AMERICAN LAWYER (June 28, 2016), archived at <https://perma.cc/FD46-KN69> (highlighting the importance of collaboration and sharing information with clients).

⁹⁷ See *Collaborative Writing*, *supra* note 4 (identifying the current practice of using word processors instead of relying on new software tools).

⁹⁸ See *Collaborative Writing*, *supra* note 4 (describing traditional word processing workflows for documents).

⁹⁹ See Kingsley Martin, *Contract Performance Metrics: Achieving All Project Goals with Standards*, CONTRACTSTANDARDS BLOG (Oct. 21, 2014), archived at <https://perma.cc/5KJT-FMLX> (highlighting technology to compile metrics for successful contract terms).

- The extent to which the business implementing the contract has found that this clause is not complied with or not fully complied with.¹⁰⁰

4. Possible Objections

4.1. Lawyers can't or won't draft like this

A first impression may be that the tagging example given in Figure 2 is hard to read and would be difficult to draft.¹⁰¹ A response to this is:

- It would not be too hard to read, because the lawyer could have on their screen at the same time a simultaneous compilation of the markup text that shows it in its published form, without the tags.
- It would not be too hard to draft, given that lawyers are already good at writing in a highly structured way.¹⁰² Drafting is already a slow and somewhat mechanical writing process, and this would not make it significantly more so.¹⁰³

¹⁰⁰ See Kingsley Martin, *Contract Visualization*, CONTRACTSTANDARDS BLOG (Sept. 10, 2014), archived at <https://perma.cc/8BS2-SMSC> (depicting visual data of contract clause commonality); Kingsley Martin, *Contract Performance Metrics: The Hidden Cost of Protracted Negotiations*, CONTRACTSTANDARDS BLOG (Oct. 13, 2014), archived at <https://perma.cc/NK4Y-WTDC> (comparing traditional negotiations to efficient negotiations based on software reports).

¹⁰¹ See Kate Ray, *Don't Believe Anyone Who Tells You Learning To Code Is Easy*, TECHCRUNCH (May 24, 2014), archived at <https://perma.cc/R2RN-MYND> (describing the difficulty of learning to code).

¹⁰² See Surden, *supra* note 73 (describing laws as having a strong “implicit” structure, which is contrasted with “explicit, machine-readable” structures).

¹⁰³ See *id.* (explaining why tagging does not make drafting contracts any slower or more difficult).

•It is not beyond the capacity of lawyers, given that authors in many other fields have learned to author content in markup languages.¹⁰⁴ The next generation of lawyers is also increasingly familiar with software development and digital publishing, with many having learned basic coding at school or university.¹⁰⁵

4.2. *This won't be effective without industry-wide standards*

A markup language does not need to be widely adopted in order to be useful.¹⁰⁶ Markup languages and the software that supports them are sufficiently low-cost to develop that they can be implemented with moderate investment at the firm level, although it may be more appropriate to have a software company develop the system than do it in-house in a law firm.¹⁰⁷ The need to have a standard format for document exchange in a legal transaction is outdated.¹⁰⁸

¹⁰⁴ See *Markup Language Definition*, THE LINUX INFORMATION PROJECT (Jan. 7, 2007), archived at <https://perma.cc/Q72W-SE83> (discussing the widespread use of markup language in various professional fields).

¹⁰⁵ See John Lauerma, *Nice Ivy League Degree. Now if You Want a Job, Go to Code School*, BLOOMBERG BUSINESSWEEK (May 7, 2015), archived at <https://perma.cc/E3H5-M3C5> (illustrating the demand for coding that exists for job-seekers).

¹⁰⁶ See Michael Rubacki, *Online legislation from Australian Governments: achievements and issues*, AUSTRALASIAN LEGAL INFORMATION INSTITUTE (May 7, 2013), archived at <https://perma.cc/M5Y9-4WDZ> (illustrating how the lack of consistency in drafting legislation has been a major lost opportunity in areas such as the drafting of the Australian legislation).

¹⁰⁷ See Cunningham, *supra* note 44, at 316-17 (2006) (arguing that the very ease of creating legal-specific markup means that standards are necessary to define a single vocabulary so that legal markup languages do not become a “Tower of Babel”); see also George Bina, *An XML Solution for Legal Documents*, XML PRAGUE 2013 (2013) at 51-60, archived at <https://perma.cc/L9KX-AAKC> (providing an example of a project that has implemented XML in legal contracts). The actual cost would depend on the functionality and sophistication of the system, but nothing proposed in this paper is particularly innovative from a software perspective. *Id.* at 55-56. All that is unusual is applying it to law. *Id.* at 51.

¹⁰⁸ See Margo H. K. Tank et al., *A Brief Guide to Using Electronic Signatures in Securities Transactions*, BUCKLEY SANDLER LLP (July 1, 2013), archived at

Online data rooms such as Ansarada are a perfect example of how the party holding the pen in a transaction can determine the interface by which clients and other parties interact with transaction documents.¹⁰⁹ It is submitted that it is perfectly plausible that many contracting parties could manage their contract negotiations within web-based applications that are accessible to lawyers, their clients and the other side, without needing recourse to emailing documents back and forth in traditional word processor format.¹¹⁰

4.3. This can be done as well or better within traditional word processors

Word processors commonly used by lawyers, such as Microsoft Word, have vast functionality and are highly customizable.¹¹¹ Large law firms have sophisticated built-in style sheets, integration with precedent systems and firm databases, and firm-specific macros.¹¹² Products such as ContractExpress Author provide examples of how computer readable structure can be added to and exploited by apps operating within traditional word processors.¹¹³

Figure 5 is a screenshot of ContractExpress Author showing variables being added to and manipulated within a contract, and its

<https://perma.cc/F2SE-RYTD> (highlighting the inadequacies of maintaining traditional paper records when modern consumers are able to acknowledge usability of different electronic formats).

¹⁰⁹ See *About Us*, ANSARADA, archived at <https://perma.cc/E9R3-W994> (providing an example of an interactive website for transactions).

¹¹⁰ See Cunningham, *supra* note 44, at 337 (arguing that the extensive scope of tagging expenditures could be cut down by using XML).

¹¹¹ See *Word 2016*, MICROSOFT, archived at <https://perma.cc/DYN2-3XJ8> (explaining the function of Microsoft Word).

¹¹² See Blair Janis, *How Technology Is Changing the Practice of Law*, AMERICAN BAR ASSOCIATION, archived at <https://perma.cc/Y2ES-DZK2> (illustrating the efficiency of using a law firm's template database).

¹¹³ See Press Release, Thomson Reuters, Thomson Reuters Strengthens Document Automation Capabilities with the Release of Contract Express 6.0 (June 29, 2016) (on file with Thomson Reuters) (describing how Contract Express can be utilized within Microsoft Word).

integration with Microsoft Word.¹¹⁴ The functionality of ContractExpress Author includes:

- The ability for the user to create their own variables.
- Integration with clause libraries
- Automated insertion of repeated information (such as details about parties)
- Support integration with external databases.
- Integration with external dictionaries.
- Validation alerts such as date ranges, text lengths and text masks.¹¹⁵

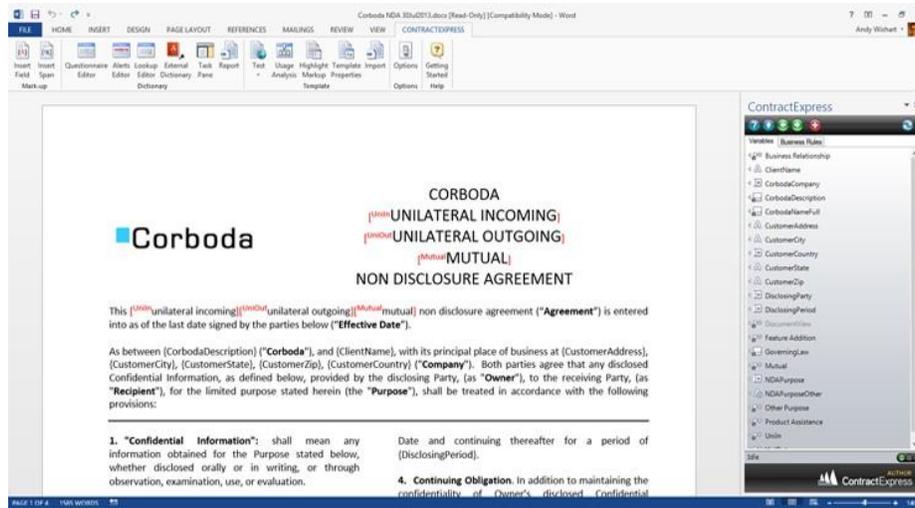


Figure 5: Screenshot of Contract Express Author (BusinessIntegrity 2015)

Using apps to add this functionality to traditional word processors carries with it the substantial benefits of using a tool with which lawyers are already familiar and comfortable.¹¹⁶ Can a case be made then to depart from traditional word processors, which have the

¹¹⁴ See *infra* Figure 5.

¹¹⁵ See *Contract Express Author*, THOMSON REUTERS, archived at <https://perma.cc/6LJQ-VHF2> (listing and describing features of contract automation tools).

¹¹⁶ See Thomson Reuters, *supra* note 113, at 1-2 (explaining the new contract drafting tools added to Microsoft Word to improve capabilities).

immense benefits of almost universal market saturation, are highly functional and highly customizable?¹¹⁷

One issue with traditional word processors such as Microsoft Word is that to the extent that computer readable structure is able to be added, it is entered into a proprietary software with limited ability for reuse in other applications.¹¹⁸ The underlying format of files authored in traditional word processors is designed to remain within that software.¹¹⁹

Arguments for not using a traditional word processor include that:

- Much of the functionality of traditional word processors can be replicated in other software, and in fact the opportunity exists to intentionally choose pared down functionality that is more fit for purpose.¹²⁰

¹¹⁷ See Nicole Black, *Today's Tech: How A Business Lawyer Uses Document Automation In His Practice*, ABOVE THE LAW (May 7, 2015), archived at <https://perma.cc/3UQH-HBK4> (demonstrating the benefits of a specific software tool). For example, Doxsera's TheFormTool Pro allows for firms to further automate already simple tasks on word processors. *Id.* See also Joy White, *Document Assembly for Real Lawyers*, ATTORNEY AT WORK (March 7, 2013), archived at <https://perma.cc/G6VA-SDPW> (comparing advantages of specific software programs to advantages of general word processors plug-in capabilities).

¹¹⁸ See Jim Hendler et al., *A Primer on Machine Readability for Online Documents and Data*, DATA.GOV (Sept. 24, 2012), archived at <https://perma.cc/B9N6-X3GL> (characterizing the issues of communication with different file formats and the inability to communicate and function within different applications). For example, because "Comma Separated Variables" ("CSV") is a text-based format there is difficulty to search for common elements within the document and then apply that search among datasets. *Id.* As a result, "Resource Description Framework" ("RDF") is used to search and apply common terms among different datasets. *Id.*

¹¹⁹ See *How to convert file type online*, LIUTILITIES, archived at <https://perma.cc/4AEA-ML9H> (explaining the difficulty in converting certain word processing file types such as PDF to .doc).

¹²⁰ See Casey Sullivan, *Goodbye Cruel Word: 5 Good Alternatives to Microsoft Word*, FINDLAW (June 3, 2015), archived at <https://perma.cc/PW7X-R6B6> (listing affordable alternatives to Microsoft Word that lack some traditional features but include added benefits); see also *FYI: Document Assembly*, AMERICAN BAR ASSOCIATION, archived at <https://perma.cc/6LPR-RSN4> (providing examples of individual document assembly applications compared to traditional uses of Microsoft Word).

- If you added computer readable structure to contracts using an app integrated into a word processor, once you load it up to a repository and download it in another application you are likely to lose much of the formatting, style and track changes, as these elements of the document will be stored in the word processor's proprietary format and not accessible to other applications.¹²¹
- Writing in a more directly computer readable form using the conventions of mark-up languages seems intimidating at first, but can be learned relatively easily.¹²²
- If we are going to follow a trend of increasingly adding computer readable structure to legal content, then for efficiency reasons it seems desirable for lawyers to add the structure directly.¹²³ Relying on programmers to perform these tasks adds delay and cost, and there are often enormous time pressures on contract drafting.¹²⁴
- The user experience for writing in a markup language is better than relying on a software platform that conceals computer readable information that is relevant to the author.¹²⁵ Lawyers have an interest in controlling the whole content of what they are authoring, and as the computer readable element of this grows in sophistication and usefulness it is increasingly desirable for lawyers to

¹²¹ Email from Tarjei Maridal, Software Developer, Adaptive Insights Australia, to author (May 27, 2015) (on file with author) (noting the shortcomings of using these applications because they will not keep document formatting when being opened with a different application).

¹²² See James H. Coombs et al., *Markup Systems and the Future of Scholarly Text Processing*, THE XML COVER PAGES, archived at <https://perma.cc/T2N5-JNT7> (explaining the transition to using markup language as a simplified process).

¹²³ See THOMSON REUTERS CONTRACT EXPRESS, archived at <https://perma.cc/SU8A-WLNM> (proving that one of the benefits of the Contract Express application is that it reduces the need to rely on programmers to add structure to legal documents).

¹²⁴ See *id.* (listing reasons firms may prefer Contract Express as opposed to traditional means of contract creation).

¹²⁵ See *The Benefits of Learning the Basic Web Programming Language HTML*, SLIDESHARE (Sept. 22, 2009), archived at <https://perma.cc/4LTE-D98Y> (describing the ease of self-teaching HTML and hypertext markup language).

have visibility of what is occurring “behind the scenes” and in the metadata.¹²⁶

•A significant intangible benefit of learning to use a markup language is becoming literate with a mode of thinking and writing that is increasingly important in the modern world.¹²⁷ This author’s own experience with math and engineering students has been that their learning markup or programming languages leverages into other creative activities involving technology.¹²⁸ Lawyers should be looking to develop highly deployable and relevant skills such as this to give them a better chance of adding value to their legal service and differentiating themselves from their competitors.¹²⁹

4.4. The structure is vulnerable to changes in technology

An issue with any digital information is its vulnerability to changes in technology, which may make it obsolete or inaccessible if it is not regularly migrated to new software and new platforms.¹³⁰ However, within a firm that has adopted particular conventions of standard markup language, the data should remain sufficiently clean and consistent to enable easy migration over time, though older files may have less functionality than newer ones.¹³¹ The foundation of

¹²⁶ See Triantis, *supra* note 29, at 192 (noting that computer readable automation technology allows lawyers to focus their resources more strategically).

¹²⁷ See *The Benefits of Learning the Basic Web Programming Language HTML*, *supra* note 125 (showing the benefits of learning markup language).

¹²⁸ See Peter Skehan, A COGNITIVE APPROACH TO LANGUAGE LEARNING 29-30 (1998) (illustrating how rule based language learning enhances cognitive creativity and flexibility).

¹²⁹ See Triantis, *supra* note 29, at 185 (noting that without developing modern skills, lawyers can become stagnant and are unable to differentiate themselves in a commoditized industry).

¹³⁰ See Claire M. Germain, *Digitizing the World’s Laws* 19-20 (Cornell Law Faculty, Working Paper No. 72, 2010) (arguing that technological systems can guarantee no more than fifty years of access).

¹³¹ See Tom Sheldon, *HTML (Hypertext Markup Language)*, LINKTIONARY, archived at <https://perma.cc/P4PV-EWN9> (explaining the easy transition over updated markup language formats).

this solution is basic text files, which it is difficult to envisage being made completely obsolete or inaccessible.¹³²

5. How This Compares to What Others are Doing

This section considers how the proposal set out in this note relates to other work being done in legal document production and publishing.¹³³ Table 2 describes examples of where markup languages have been used to add structure to legal content.¹³⁴ Table 3 describes some companies which currently use structured precedents to provide contract automation services.¹³⁵ Table 4 describes examples of companies which undertake computational analysis of legal texts, the efforts of which could be enhanced by legal texts with existing machine readable structures.¹³⁶

¹³² See *id.* (recognizing that documents defining HTML standards are advancing, therefore rendering older versions inadequate).

¹³³ See *supra* Section 2.2 (establishing potential benefits of this method).

¹³⁴ See Graham Greenleaf et al., *Public access to law via internet: the Australasian Legal Information Institute*, AUSTRALASIAN LEGAL INFORMATION INSTITUTE, archived at <https://perma.cc/XNK3-PM8G> (detailing the goals of future research and development); *About LegalXML*, LEGALXML, archived at <https://perma.cc/LVM3-9M59> (giving an overview of the uses and participating members of LegalXML); *Purpose*, AKOMA NTOSO, archived at <https://perma.cc/625X-EJ54> (describing the objectives and purposes of Akoma Ntoso initiative).

¹³⁵ See *Contract Express Overview*, THOMSON REUTERS CONTRACT EXPRESS, archived at <https://perma.cc/8XVF-JXQV> (articulating the benefits and differences of Contract Express versus other services); *Internet Software and Services: Company Overview of LegalZoom.com, Inc.*, BLOOMBERG BUSINESSWEEK, archived at <https://perma.cc/E4S6-SYRK> (outlining LegalZoom's applicability to different areas of law); *FAQ*, SHAKE BY LEGALSHIELD, archived at <https://perma.cc/9RQL-NNRB> (providing user-friendly benefits of Shake by LegalShield for smartphone users).

¹³⁶ See *Legal Intelligence*, PALANTIR, archived at <https://perma.cc/Y4UH-M49C> (explaining the data analytics used to consolidate legal information); *Products Built for a Purpose*, PALANTIR, archived at <https://perma.cc/JC4L-PNMT> (claiming that products improve productivity in the workplace); *Business Law Center*, THOMSON REUTERS, archived at <https://perma.cc/H6WF-BT7R> (illustrating the productivity benefits from Business Law Center services); *Welcome to KMStandards*, KMSTANDARDS, archived at <https://perma.cc/JRX4-4D3P> (establishing the time-saving methods provided by KMStandards); *Legal Analytics by Lex Machina*, LEX

These companies and products give interesting examples of how legal content can be manipulated and analyzed in non-traditional ways through technology.¹³⁷ However, we were not able to find an example of the solution proposed in this paper, where practicing lawyers would use a markup language throughout the life of contract documents from initial creation to publishing.

6. Conclusion

Authoring legal documents in markup language offers enormous potential to enhance how legal documents are drafted, shared, and reused.¹³⁸ While there would be a learning curve for lawyers, many other professionals have managed to do it, and lawyers have long practiced writing in a highly structured way.¹³⁹

Learning a new skill might even add interest to some lawyers' lives and encourage an attitude of creativity and innovation in other areas of their practice.¹⁴⁰ Programming is such a useful skill that we should be optimistic about how even basic familiarity with a legal markup language can give lawyers a greater awareness of what's possible in software development, build capacity and spark the desire to make tools to meet needs that lawyers are uniquely positioned to see.¹⁴¹ Existing systems and software used in the legal industry have

MACHINA, *archived at* <https://perma.cc/8LFA-MY4S> (listing the advantages of using analytics in litigation).

¹³⁷ See *Contract Express Overview*, *supra* note 135 (detailing how Contract Express produces questionnaires for each legal document); *Internet Software and Services: Company Overview of LegalZoom.com, Inc.*, *supra* note 135 (outlining legal documents available to consumers through LegalZoom's service); *FAQ*, *supra* note 135 (explaining how consumers can use LegalShield to document agreements that might otherwise remain verbal agreements).

¹³⁸ See Vanderbeck et al., *supra* note 14 (hypothesizing the potential of machine learning capabilities).

¹³⁹ See Waters, *supra* note 43, at 35 (identifying the opportunities for professionals to utilize technological innovations).

¹⁴⁰ See Triantis, *supra* note 29, at 207-08 (addressing the advantages of lawyers acquiring a variety of skills).

¹⁴¹ See *The Benefits of Learning the Basic Web Programming Language HTML*, *supra* note 125 (expounding the benefits of learning web coding skills).

adopted computational structures before.¹⁴² For example, many firms have structured versions of precedents to enable automated contract assembly.¹⁴³ Contract Express and others also have structured base precedent documents.¹⁴⁴ However, while these systems have structure initially, they output into normal word processing formats such as Microsoft Word usually before the contract is significantly customized and negotiated.¹⁴⁵ Any structure within the precedent is lost as soon as a lawyer starts to edit it in a normal word processor.¹⁴⁶ It seems to have always been assumed that lawyers could not learn to use anything else.

The field of computational law is rapidly developing, and there may be increasing demand for law to be written in formal computational structures.¹⁴⁷

<p>Australasian Legal Information Institute</p>  <p>Australasian Legal Information Institute</p>	<ul style="list-style-type: none"> •One of the earliest free online legislation repositories •Uses markup language to enable search and display of legislation by section, linking and indexing •Has proved to be an invaluable resource for Australian lawyers because of its simplicity of access and use
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¹⁴² See Surden, *supra* note 88, at 35 (observing the use of computational software by firms for tax regulations).

¹⁴³ See Surden, *supra* note 88, at 35 (highlighting the benefits of a firm's automating contracts system).

¹⁴⁴ See *infra* Table 2 (noting Contract Express capabilities).

¹⁴⁵ See Thomson Reuters, *supra* note 113 (describing the interaction of Contract Express with Microsoft Word).

¹⁴⁶ See Thomson Reuters, *supra* note 123 (portraying the inadequacies of manual drafting and the benefits of Contract Express automated software).

¹⁴⁷ See Michael Genesereth, *Computational Law: The Cop in the Backseat*, STANFORD UNIVERSITY, archived at <https://perma.cc/3CS3-76ZX> (expressing improvements with recently updated technology for automated legal systems); see also Eguchi & Leff, *supra* note 53, at 285 (discussing how markup can facilitate computational reasoning and rule-based technologies during litigation); Surden, *supra* note 88, at 35 (identifying tax law use of computational structures); Szoke et al., *supra* note 72, at 486 (articulating the embedded logic structures in legal texts).

<p>Legal XML</p> 	<ul style="list-style-type: none"> •Developing open XML standards for legal documents •Focused on court documents •Investigating how legal arguments can be created, evaluated and compared using rule representation tools, and self-improving electronic legal information
<p>Akoma Ntoso</p> 	<ul style="list-style-type: none"> •Defines parliamentary, legislative and judiciary documents in XML formats •Makes the structure and semantic components of digital documents explicit •Has drafted legislative drafting guidelines that define common structural elements of legislation

Table 2: Examples of legal XML development

<p>Contract Express</p> 	<ul style="list-style-type: none"> •Integrated contract development platform •Uses many of the benefits of a markup language in how it produces documents, but ultimately produces “flattened” documents in which the drafter is not involved in giving the document a meaningful structure for later computational analysis
<p>LegalZoom</p> 	<ul style="list-style-type: none"> •Offers consumer legal services through their website, including incorporation, trademark, real estate and patent services •Although designed to be used by consumers, it often used by lawyers who find it to be an efficient workflow management system

<p>Shake</p> 	<ul style="list-style-type: none"> •Provides free legal agreements online, from your smartphone •Focuses on “tiny law” and small transactions •Interface asks plain language questions before producing a contract
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Table 3: Examples of companies providing contract automation services

<p>Westlaw Business</p> 	<p>Enables automated checking of legal documents, including checking cross referencing, unpaired punctuation, defined term discrepancies, phrases and open issues</p>
<p>KM Standards</p> 	<ul style="list-style-type: none"> •Natural language processing and some manipulation of contract documents •While this uses the benefits of a markup language, this is not visible to the user. Also, it is likely that the functionality of KM Standards could be increased if it were analyzing semi-structured documents as this note proposes, rather than the largely unstructured documents they currently use •KM Standards is also a contract automation technology, which can classify contracts and create a reference standard against which to analyze other contracts, and from which users can generate new contracts
<p>Lex Machina</p> 	<ul style="list-style-type: none"> •Predictive analytics which synthesizes case by district, outcome and by judge and gives

	you a percentage rating of prospects •Based on computational analysis of cases, which produces multitudes of tags in case texts, none of which are applied by humans
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Table 4: Examples of companies providing legal data analytics

This is not what is proposed here, which is a less ambitious solution. However, if lawyers began drafting in markup languages, there might be potential for “hybrid” contracts, which have elements of computational law and natural language provisions. Over time this could facilitate convergence between traditional legal drafting and computational law, and perhaps permit contracts that are a hybrid of computational law and natural language. This is much easier to envisage being implemented when lawyers have become familiar with computer readable languages and content creation tools that more resemble software development tools than traditional word processors.