

LANGUAGE, DEALS AND STANDARDS: THE FUTURE OF XML CONTRACTS

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Abstract

eXtensible Markup Language (XML) structures information in documentary systems ranging from financial reports to medical records and business contracts. XML standards for specific applications are developed spontaneously by self-appointed technologists or entrepreneurs. XML's social and economic stakes are considerable, especially when developed for the private law of contracts. XML can reduce transaction costs but also limit the range of contractual expression and redefine the nature of law practice. So reliance on spontaneous development may be sub-optimal and identification of a more formal public standard setting model necessary. To exploit XML's advantages while minimizing risks, this Article envisions creating a publicly-oriented foundation to set XML-based standards for the private law of corporate contracts. The Article's specific inquiry concerning corporate contracts illuminates XML's broader implications, making the standard-setting model it contributes adaptable to other contexts.

Subject Matters: Contracts (including E-Commerce); Corporate Law (including corporate law practice); Intellectual Property Law (including ownership of standards); Law & Economics (especially nexus of contracts, theory of the firm); Law & Technology (especially structured information systems).

Key Words or Concepts: complexity; complexity theory; corporate form practice; corporate lawyers; electronic commerce; extensible markup language; KXML; language; law firm economics; law practice; legal sociology; modularity; nexus of contracts; open source; public/private; networks; network externalities; transaction cost engineering; standard setting; term complexity index; XML.

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INTRODUCTION

Among modern technology's manifestations is the proliferation of non-natural languages used to impose structure on information. Examples are computer code and data description semantics. Applications develop spontaneously through channels such as consortia standard-setting, competitive commercial exploitation, and open-source protocols. As a substantive matter, these tools pose social and legal consequences hinging upon the relative desirability of linguistic rigidity versus flexibility; as a procedural matter, issues of leadership legitimacy and accountability arise. For some applications, the implications are so strong that novel hybrid public-private standard setting models are emerging. This Article evaluates new linguistic tools for use in private contracting as a case study of how the substantive stakes justify such publicly-oriented procedural innovation.

The most powerful modern tool for structuring information is extensible mark-up language (XML), a data-description meta-language that uses symbols to translate natural language. It is being developed for a wide range of applications from accounting to medical recordkeeping and commercial contracting in the industrial supply chain. Relevant data, such as price and quantity terms in commercial exchanges, are tagged with set designations so that those fluent in tagging vocabularies can read them. Appeal arises from ability to program computers to understand the language. Computers can communicate with each other and accomplish many tasks that people traditionally do, including forming and processing contracts. XML standards are well-established for dozens of applications with extensive networks of users.

Inchoate efforts are underway to develop XML for narrative contracts, including preliminary standard-setting by a self-appointed technology consortium and through private entrepreneurship.¹ Narrative contracts are most common in corporate transactional contexts, like mergers and financings, involving trillions of dollars in aggregate exchange.² To document these transactions, corporate lawyers traditionally engage in elaborate contracting processes and struggle to draft agreements using stylized language in contracts of growing density, often containing hundreds of terms. This is followed during a contract's life by other lawyers laboring to interpret the language so

¹ On standard setters for contracts, see OASIS LEGAL XML (E-CONTRACTS TECHNICAL COMMITTEE), REQUIREMENTS FOR TECHNICAL SPECIFICATION VERSION 1.0 (May 17, 2005) [hereinafter OASIS LEGAL XML]; on entrepreneurship, *see infra* text accompanying note 143 (West Group and private lawyers). OASIS stands for Organization for the Advancement of Structured Information Systems.

² For this Article, *commercial* contracting denominates transactions in goods such as inventory sales where contract documentation emphasizes a few discrete terms such as price and quantity; *corporate* contracting denominates complex substantive transactions such as mergers or financing arrangements where documentation entails elaborately narrated provisions. Annual exchange volume using such contracts approaches trillions of dollars, through thousands of merger agreements, credit agreements and other corporate contracts. *See* Michael P. Vandenberg, *The Private Life of Public Law*, 105 COLUM. L. REV. 2029, 2045 n. 68 & 2051-52 n. 100 (2005); U.S. Department of Commerce, *E-Stats: E-Commerce 2003 Highlights*, www.census/estats (2005).

agreed. Yet later corporate lawyers use precedent contracts as departure points when preparing new contracts. All these exercises are performed under tight time pressure.

Lawyers use various tools to meet the time-sensitive demands of intricate drafting and rigorous interpretation. Traditionally, this included maintaining standard printed forms of agreement treated as precedents; increasingly, lawyers create and preserve agreements in electronic forms that enable word searching. While useful, such tools are only partial solutions to meeting the corporate lawyer's burden. Despite them, clients often complain that corporate contracting is too protracted and evidence shows that resulting contract terms sometimes are oversimplified or excessively complex. Both problems increase transaction costs associated with these important exchanges.

XML offers a powerful way to reduce such transaction costs—and ease the corporate lawyer's burden. XML pioneers envision structuring narrative contract texts into modules that would make the contracting process swifter and yield more efficient terms by purging excess complexity without oversimplifying. While appealing, there is some risk that such tools could mechanize the meaning of contractual terms with unintended consequences. This is because XML is a language. As such, using XML as a contracting tool could produce a backfire, as by rigidly limiting the possible range of contractual expression. The stakes of applying XML in narrative contracting are thus high and justify this Article's systematic inquiry into its substance and the procedures used to develop it.³

Substantively, XML can be used to structure the information currently found in precedent corporate contracts. These would be arranged in modular form, defined using XML standards. Corporate lawyers would access the resulting repository of forms when preparing new contracts, improving current practice by reducing transaction costs that arise from oversimplification and excess complexity. Guarding against XML's rigidity, resulting contracts would, in turn, automatically be harvested for rendition into the repository so that it is continuously refreshed. Procedurally, the repository would be created and maintained by a new publicly-oriented foundation formed to establish such public standards for private law. This novel approach is intended to promote this innovative tool's responsible use across networks of participants.

While this Article thus focuses on corporate transactions and contracts, the contributed standard-setting model is adaptable for other XML applications. These especially include the infinite variety of documentary settings in which lawyers in all practice areas routinely engage. Law practice is a sociological phenomenon that facilitates advancing the interests of particular clients while affecting others throughout society. When law practice is altered by technological innovation, society itself is altered too. Accordingly, this Article's specific study of emerging technology in corporate law

³ Little writing about XML appears in the legal academic literature. A handful of contributions address intellectual property or basic contract issues. Professor Jane Winn pioneered interest by hosting a symposium that produced several important contributions. *E.g.*, Jane K. Winn, *Making XML Pay: Revising Existing Electronic Payment Law to Accommodate Innovation*, 53 SMU L. REV. 1477 (2000).

practice resonates as an inquiry into the broader implications for legal sociology of technological innovation.

I. XML TOOLS

The concept of a “mark-up language” designates the activity of inserting nomenclature into natural language texts to enable software recognition.⁴ People mark up document text following defined rules to categorize data and structure using the < and > symbols appearing on standard keyboards (these are called tags). The rules take the form of a common, base-level framework known as a grammar or syntax. Computers are programmed to recognize the tags and follow related instructions.⁵

Scalable mark-up languages useful in an expanding array of applications have evolved through several generations since primitive versions were invented in the 1970s. Perhaps the most familiar mark-up language is hyper-text mark-up language (HTML).⁶ This is a document format language commonly used to define structure and text of Web pages. It includes pre-defined tags that indicate which text is part of a header, paragraph

⁴ The idea of “mark-up language” shares the same roots as the term “marking-up” that lawyers use to describe drafting exercises involving changing contract language. Both derive from ancient practices in publishing and other document-production undertakings—including law—of affixing signals to text to give direction to another person.

⁵ Helpful to understanding XML is background about electronic documents. See Winchel “Todd” Vincent, III, *Legal XML and Standards for the Legal Industry*, 53 SMU L. REV. 1395, 1397-1404 (2000). A “document format” is a technical grammar (also known as “syntax”) that defines an electronic document. Electronic documents capture three information types: (1) *formatting* designates how text looks to readers; (2) *logical structure* designates the relationship among grammatical parts that provide cues to users (analogous to structures within books, as chapters, sections, paragraphs, words and letters or within contracts, as definitions, sections, paragraphs and clauses); and (3) *data* designate pieces of information (like buyer, seller, name, address), which can be “logically structured” (as in the preamble to a contract) or appear as “unstructured text” (as when the words buyer and seller are used in narrative content throughout a contract).

Document formats come in three classes: (1) *page description formats* strictly capture a document’s layout (as in *pdf*, Portable Document Format); (2) *mark-up-based formats* may capture formatting, but also capture data and logical structure by surrounding text within “tags” (as in HTML, hyper-text mark-up language, although HTML does not separate formatting from logical structure, creating limitations in its capacity to capture a rich variety of data); and (3) *compound document formats* capture a mix of formatting and logical structure (as in Word, WordPerfect or Rich Text Format (RTF)) but do not strictly capture layout (that is why, for example, when importing an RTF document created in Word, formatting often changes). XML is a grammar/syntax used to define mark-up based formats. It creates such document formats by combining customized “elements.” An element is a combination of a “begin tag” [<] and “end tag” [>] and everything in between the two [<in between>]. It may contain text (called “PC data”), other elements (tags and text), or be empty (contain no text). Elements are nested within other elements to create a hierarchy of “marked-up” text. A complete hierarchy of marked-up text is an “XML document.” Examples appear in notes 7 and 19, *infra*.

⁶ Software fluent in HTML includes Web browsers like Netscape Navigator and Microsoft Internet Explorer. These enable users to read (browse) HTML documents. See GARY P. SCHNEIDER, *ELECTRONIC COMMERCE* 77 (6th ed. 2006).

or numbered list element.⁷ While powerful, its utility is limited because tags usually do not bear meaningful substantive relationships to the text within them. This limitation prevents using HTML in contracting exercises, which require substantive recognition of customized data from invoices and purchase orders and other transactional terms.⁸

XML overcomes these limitations of HTML, making it ideal for contracting and innumerable other applications.⁹ First, unlike HTML, XML conveys the substantive meaning of information included within its tags (called, in the related literature, semantics). Second, XML is a meta-language, meaning it can be used to create additional languages.¹⁰ The general form of XML was established in 1998 by a consortium known as the World Wide Web Consortium (W3C).¹¹ Specific applications are developed by a growing variety of standard setters. By design, this means that users create their own mark-up elements that extend XML's usefulness. This is why it is called an "extensible" language.¹² XML's appeal for contracting—and potentially infinite other contexts—is this extensive scope of tagging power. It enables defining any number of custom elements tailored to particular applications.¹³

⁷ HTML tags may be viewed for any Web page by clicking on *source* in a browser. An abstracted excerpt from the Web site of the United States Supreme Court follows.

```
<html>
<head>
<title>United States Supreme Court Site Map</title>
<center>
<table width=600 cellspacing=0 cellpadding=0>
<td align=center>
<table width=600 cellspacing=0 cellpadding=0>
<a href="http://www.supremecourtus.gov/index.html">
<href="http://www.supremecourtus.gov/oral_arguments/oral_arguments.html">
<a href="http://www.supremecourtus.gov/orders/orders.html">
<a href="http://www.supremecourtus.gov/visiting/visiting.html">
<a href="http://www.supremecourtus.gov/publicinfo/publicinfo.html">
<a href="whatsnew.html">
<a href="security.html">
</body>
<!-- InstanceEnd -->
</html>
```

⁸ SCHNEIDER, *supra* note 6, at 77 (while HTML is good for layouts, it has trouble "presenting or maintaining information lists").

⁹ Many examples of XML tagging may be viewed through links to the XML Registry, <http://www.xml.org/>.

¹⁰ E.g., Norman Walsh, *A Technical Introduction to XML* (Oct. 3, 1998 and updated), <http://www.xml.com/pub/a/98/10/guide0.html>; STEVEN HOLZNER, *REAL WORLD XML* (2003); SIMON ST. LAURENT, *XML: A PRIMER* (3d ed. 2001); see also <http://www.w3schools.com>.

¹¹ W3C Press Release, *The World Wide Web Consortium Issues XML 1.0 as a W3C Recommendation* (Feb. 10, 1998), <http://www.w3.org/Press/1998/XML10-REC>.

¹² SCHNEIDER, *ELECTRONIC COMMERCE*, *supra* note 6, at 70.

¹³ See Vincent, *supra* note 5, at ____.

A. Selected Applications

XML is permeating many documentary systems.¹⁴ For example, XML-readable documents are used successfully to administer financial derivative contracts designed to hedge various commercial risks. The trade association, International Swaps and Derivatives Association, Inc. (ISDA), develops tagging semantics into a single XML vocabulary known as financial product mark-up language (*fpml*).¹⁵ Market participants and their computers use this language to settle trades and maintain books and records.

Extensible business reporting language (XBRL) applies XML to digital financial information, pioneered by a private consortium called xbrl.org and promoted for use in public law by the Securities and Exchange Commission (SEC).¹⁶ Tags are assigned to underlying classifications of accounting data and to each line item of general purpose financial statements. The resulting semantics define various accounts or categories, such as current assets and current liabilities. Computers can parse these elements to generate related information, such as the current ratio (computed as the ratio of current assets to current liabilities). These tools are used to assure and report on compliance with financial covenants and other contract terms and facilitate reporting financial information on a substantially current basis.¹⁷

For commercial contracts, tags are assigned to information such as price and quantity plus other terms ranging from governing law clauses to accounting terminology. To date, the major extension of XML for commercial contracting is ebXML, denominating “electronic business” XML.¹⁸ In this setting, critical data are the price of a

¹⁴ See SCHNEIDER, ELECTRONIC COMMERCE, *supra* note 6, at 81 (“hundreds of publicly defined XML vocabularies are currently circulating, many of which are registered with the XML Registry,” including for mathematics and those mentioned in the text); U.S. GEN. ACCOUNTING OFFICE, ELECTRONIC GOVERNMENT: CHALLENGES TO EFFECTIVE ADOPTION OF EXTENSIBLE MARKUP LANGUAGE 20 (April 2002), available at <http://www.gao.gov/new.items/d02327.pdf> [hereinafter GAO REPORT] (also noting Human Resources Markup Language).

¹⁵ See <http://www.fpml.org>. While the *x* in XML signals eXtensible, some developers treat it as one would an algebraic variable, filled with an appropriate value (as in *fpml* for financial product markup language).

¹⁶ See <http://www.xbrl.org>. For examples of XBRL, see <http://www.xbrl.org/FRTaxonomies/>. The SEC classifies electronic filings using XML or XBRL as “structured filings;” the percentage of total filings classified as structured increased from 21% in 2003 to 35% in 2004 and 2005. SECURITIES AND EXCHANGE COMMISSION, ANNUAL REPORT, p. 43 (2005). The SEC launched a formal program promoting this approach in 2004, calling it “part of a broad, multi-year initiative to assess the benefits of tagged data, which could dramatically improve the ability of investors and the SEC staff to analyze issuers’ financial data.” SECURITIES AND EXCHANGE COMMISSION, ANNUAL REPORT, p. 13 (2004).

¹⁷ See Matthew Bovee, *et al.*, *Assessing the 07/31/2000 XBRL Taxonomy for Digital Financial Reports of Commercial and Industrial Firms* (July 23, 2001), <http://ssrn.com/abstract=277698>; see also Robert E. Pinsker & Stephen C. Gara, *The Socio-Economic Impact of XBRL Usage* (Am. Acct. Ass’n 2004 Mid-Atlantic Region Meeting Paper) abstract on http://papers.ssrn.com/abstract_id=489022.

¹⁸ See ebXML Technical Architecture Specification v1.0.4, www.ebxml.org/specs/ebTA.doc; see also <http://www.ebxml.org/>.

good and the quantity ordered. Applying ebXML, such data are tagged for use in electronic documents by inserting nomenclature such as the following: <\$40 per bushel> and <1000 bushels>.¹⁹ Software programmed to read ebXML directs a computer to recognize these tags as price and quantity, respectively. It also directs the computer to perform prescribed functions with the data. These functions include posting or accepting offers on those terms and confirming resulting contracts via email.

ebXML is not *sui generis*, but evolved from technology dating to the late 1960s and early 1970s. In the 1970s, a Boston business lawyer decided that contracting was riddled with excess complexity.²⁰ To purge it, he developed a systematic method of marking up contract documents. Called Standardized General Mark-up Language (SGML), this linguistic data description tool became a recognized international standard in 1986.²¹ In 1968, the transportation industry established standards for advanced shipping notices and funds transfer systems collectively called Electronic Data Interchange (EDI) to simplify commercial trade.²² This pioneered electronic means of transmitting transaction information that streamlined contracting by dispensing with paper.²³

Various industries exploited EDI at different times. Each required significant financial investment in related infrastructure and standard-setting processes to promote

¹⁹ The following illustrates an ebXML document reflecting terms of a purchase order for a transaction in goods:

```
<?xml version="1.0" encoding="utf-8" ?>
<BusinessTransaction name="Create Order">
  <RequestingBusinessActivity
    name=""
    isNonRepudiationRequired="true"
    timeToAcknowledgeReceipt="P2D"
    timeToAcknowledgeAcceptance="P3D">
    <DocumentFlow
      isSuccess="true"
      documentType="Purchase Order"/>
    </RequestingBusinessActivity>
    <RespondingBusinessActivity
      name=""
      isNonRepudiationRequired="true"
      timeToAcknowledgeReceipt="P5D">
      <DocumentFlow
        isSuccess="true"
        documentType="PO Acknowledgement"/>
      </RespondingBusinessActivity>
    </BusinessTransaction>
```

This example is adapted from www.ebxml.org.

²⁰ See CHARLES F. GOLDFARB, THE ROOTS OF SGML: A PERSONAL RECOLLECTION (1996); <http://www.sgmlsource.com/history/roots.htm>.

²¹ ISO 8879; see CHARLES F. GOLDFARB, THE SGML HANDBOOK (1990).

²² See SCHNEIDER, ELECTRONIC COMMERCE, *supra* note 6, at 231.

²³ *Se id.*, at 230-237.

compatibility.²⁴ As a result, only larger organizations participated. In EDI's four-decade history, no litigation concerning EDI-formed contracts occurred.²⁵ This is so despite EDI transactions not always including all terms or having specificity that contract law requires to establish contract formation.²⁶ To enable EDI-type commercial contracting on a broader scale, technology standards must be affordable and universal.²⁷ XML, coupled with the Internet, facilitates both.

B. Commercial Contracts and Law

While ebXML (and XML generally) can simplify contract processing, results pose challenges to traditional contract law. These challenges have faced contract law since EDI was developed in the late 1960s. But they mattered less before XML and the Internet because transactions were confined to relatively large organizations contracting relationally.²⁸ The historical absence of litigation concerning EDI-formed contracts may be over when large numbers of smaller parties engage in many more discrete sorts of exchanges.²⁹

Challenges to contract law include ascertaining contract terms.³⁰ For example, practical problems can arise when determining whether contract formation occurred. Computers programmed to offer <terms 1, 2 and 3> may attempt to form contracts with

²⁴ *See id.* at 232-33. In 1979, the American National Standards Institute (ANSI) created the Accredited Standards Committee X12 (ASC X12) to develop EDI standards. This brought different industries together and these adopted standards by mid-1980s. By then, large manufacturers used electronic commerce in applications such as supply management and procurement. Despite standards, these tools could not be harnessed on a wide scale because they required heavy investment in infrastructure by each company. *Id.* at 9.

²⁵ *See* Jane K. Winn, *The Impact of XML on Contract Law and Contract Litigation* (manuscript, 2005, on file with the author) [hereinafter Winn, *Impact of XML*] (attributing this to relational contracting featuring long-term trust).

²⁶ *See also* American Bar Association, *Electronic Messaging Task Force, The Commercial Use of Electronic Data Interchange—A Report*, 45 BUS. LAW. 1645 (1990) [hereinafter ABA Task Force on EDI]. This Task Force offered a master agreement dubbed the Model Electronic Data Interchange Trading Partner Agreement to be accompanied by particular take-downs governing discrete transactions amid a long-term contracting relationship. In prescribing standard terms, the ABA Task Force drew upon examples from a sample of 40 contracts. *Id.* at n. 40. Finding some to favor one side to the transaction, its form equalized terms of exchange to provide what the Task Force considered to be fairer terms. *Id.* at n.52 and accompanying text.

²⁷ *See* SCHNEIDER, ELECTRONIC COMMERCE, *supra* note 6, at 231.

²⁸ *See supra* notes 24-25 and accompanying text.

²⁹ *See* Winn, *Impact of XML*, *supra* note 25.

³⁰ *See* Donnie L. Kidd, Jr. & William H. Daughtrey, Jr., *Adapting Contract Law to Accommodate Electronic Contracts: Overview and Suggestions*, 26 RUTGERS COMPUTER & TECH. L.J. 215 (2000).

those programmed to accept <terms 2, 3 and 4>.³¹ Traditional problems associated with contract law's battle of the forms multiply.³² This phenomenon means that some human role is necessary to assure that intended bargains are recognized.³³

Yet XML-based commercial contracts can be formed without human intervention. The idea of allowing computers to form contracts can be difficult to square with conventional notions of assent.³⁴ Reform initiatives address the challenge by expanding analogies from agency law to mint a concept of electronic agents or to recognize by fiat certain forms of electronic contracting.³⁵ Only a handful of states have adopted these innovations, suggesting difficulty in coming to grips with the possibility that computers can manifest assent.³⁶

Additional challenges to contract law arise from how XML-based computer-to-computer contracting increases risk of linguistic error. This occurs when a single word bears more than one meaning or when different words denote identical things.³⁷ Traditional contract law may not recognize formation of contracts when computers use different words, although to humans the words mean the same thing; other contracts may result from computers using the same word but in contexts where, to humans, they clearly mean different things.³⁸ In addition, unwritten customs that support reasonable human expectations can elude representation in computer-to-computer contracting.

³¹ See Margaret Jane Radin, *Humans, Computers, and Binding Commitment*, 75 IND. L.J. 1125 (2000).

³² See Charles Murray, *The Chaos of the "Battle of the Forms,"* 39 VAND. L. REV. 1307 (1986); see also ABA Task Force on EDI, *supra* note 26, at n. 225 (recognizing problem of battle of forms in context of EDI but opting not to provide way to resolve it).

³³ See Robert W. Gomulkiewicz, *Getting Serious About User-friendly Mass Market Licensing For Software*, 12 GEO. MASON L. REV. 687, 706 (2004).

³⁴ Radin, *supra* note 31.

³⁵ Uniform Electronic Transactions Act (UETA), <http://www.law.upenn.edu/bll/ulc/uecicta/eta1299.htm>; Uniform Computer Information Transactions Act (UCITA), <http://www.law.upenn.edu/bll/ulc/ucita/ucita200.htm>.

³⁶ See Anthony J. Bellia Jr., *Contracting with Electronic Agents*, 50 EMORY L.J. 1047 (2001); James J. White, *Autistic Contracts*, 45 WAYNE L. REV. 1693 (2000); Richard E. Speidel, *Revising Article 2: A View from the Trenches*, 52 HASTINGS L.J. 607 (2001). The American Law Institute pioneered the legislative effort in proposed revisions to the Uniform Commercial Code but abandoned the effort amid resulting controversy. The National Conference of Commissioners on Uniform State Laws revived the effort with UCITA but it retreated amid fury and withdrew lobbying efforts. See PATRICIA L. BELLIA, PAUL SCHIFF BERMAN & DAVID G. POST, *CYBERLAW* 677 (2d ed. 2004) (noting these points and that controversy hinged upon how the proposal diluted existing consumer protection laws).

³⁷ See Clayton P. Gillette, *Interpretation and Standardization in Electronic Sales Contracts*, 53 SMU L. REV. 1431 (2000).

³⁸ XML requires linguistic precision, but natural language isn't like that. People say one thing and others hear something else. In XML, a "two-word one-meaning" problem arises when, given literalism, computers cannot recognize that though they are using different words, those words mean the same thing (say "goods" and "widgets"). This limitation increases risk of error in communication; but for this problem, the

Despite contractual uncertainty, business management models emphasize the benefits of computer-based commercial contracting. Before XML was devised, EDI contracting was driven by increasing emphasis on supply-chain management. During the 1990s, automation's appeal increased amid innovations in inventory control, including "just-in-time" strategies designed to minimize inventory carrying costs.³⁹ These payoffs have outweighed the limitations of traditional contract law, leading to spontaneous proliferation of computer-to-computer contracting in commercial supply-chain transactions. Demand for computer-to-computer contracting is expected to increase as XML becomes more widely used.

C. Schemas, Modularity and Networks

While XML offers transformative capability to create and handle a large number of parameters, formidable technological and sociological hurdles confront large-scale deployment. To define data and structural elements within document types requires preparing detailed schemas called "document type definitions" (DTDs).⁴⁰ Usable mark-up language requires participants to apply the same schemas in marking up documents and computers programmed to recognize these schemas. This is easy to do with discrete or numerical terms such as price and quantity for inventory but potentially perplexing for elaborate narrative terms used in corporate contracts such as credit agreements and merger agreements.

A practical problem thus accompanies XML's impressive power. The power carries potential for too much information to be harnessed using too many different vocabularies. Multiplication of such languages would yield a functional equivalent to the

consequence is simply missing out on a deal. No contract arises, although human parties may have wished otherwise. No special legal issues appear in what is essentially a replay of the battle of the forms problem. More difficult is the one-word, two-meaning problem, famously appearing in the classic *Fragiliment* case—what is *chicken*? See *Fragiliment Importing Co. v. B.N.S. Int'l Sales Corp.*, 190 F. Supp. 116 (S.D.N.Y. 1960). Computers are programmed to recognize a word and two computers using it form a contract, although with a human understanding of context we would recognize lack of intention to assign the same meanings to the term. Error risk from this problem is low among local participants in an industry; they grow in contexts where XML for commercial contracts has greatest promise: in deals between strangers in far away lands. The problem endures when standard-setting groups in discrete areas helpfully define terms for that area but do so in ways that differ from parallel groups defining standards in other geographical areas. One requirement for overcoming this challenge is globalization of standard-setting organizations to transcend local differences. Compare *infra* text accompanying notes 230-231.

³⁹ See JOEL D. WISNER, *et al.*, PRINCIPLES OF SUPPLY CHAIN MANAGEMENT: A BALANCED APPROACH (2004).

⁴⁰ A "document type definition" ("DTD") is a set of rules that define the type, number, and order of elements that may appear in an XML document. Vincent, *supra* note 5, at _____. Two simple rules must be followed to accomplish a *well formed XML* document: (1) the document must have one single root element (such as <contract>) and (2) every element must have non-overlapping "begin tag" and "end tag" (no overlap is permitted but elements may be nested within other elements). *Id.*

“Tower of Babel.”⁴¹ While considerable value resides in the capacity for customizing XML to particular legal applications, too many participants doing so without coordination risks intractable incompatibility. The solution is to create XML standards that define a single vocabulary for specific applications so that all users speak the same language.

For application to narrative contracts, schemas (DTDs) would emphasize and reflect a modular quality. Modular, a term of art in architecture, refers to a standardized component of construction to which other parts relate in proportional measure. For contract architecture, it refers to terms common to a number of contract types otherwise addressing varying transactional purposes.⁴² A good example is a representation as to the veracity of financial statements, which appears in a wide variety of contracts (from credit agreements to merger agreements) but whose function in each is substantively identical. By defining and capturing such specific terms rather than only the varying contracts in which they appear, XML schemas would exploit the virtues of modularity. These include promoting tractability and adaptability of contractual expression across a wide range of transactional contexts, both traditional and innovative.

In addition to modularity, much of XML’s value arises from its network character. This refers to how certain products become more valuable when more users employ them. One user’s investment payoff increases when additional users are added.⁴³ The classic example of such externalities is the facsimile machine. Increased usage by new machine owners delivers exponential gains to previous owners (ownership of the only such machine is valueless).

For XML, additional users add value to preexisting users in much the same way. While for some applications network externalities accrue when the cluster of products are compatible or interoperable,⁴⁴ for XML this value accrues either exclusively or most

⁴¹ Vincent, *supra* note 5, at _____. See SCHNEIDER, ELECTRONIC COMMERCE, *supra* note 6, at 81 (potential vocabulary incompatibility means that “the greatest strength of XML, that it allows users to define their own tags, is also its greatest weakness”). A lesser-order problem is that XML’s appearance is ungainly. Computer programmers are comfortable with the language, but non-technical lawyers likely find it unappealing. At present, authoring a document in XML is akin to drafting in WordPerfect with the “reveal codes” command engaged. See Vincent, *supra* note 5, at _____. This problem can be resolved by focusing technological developments on publishing applications rather than design. OASIS LEGAL XML, *supra* note 1, at _____.

⁴² See generally Henry E. Smith, *Contract Modularity: Boilerplate and Information Flow*, 104 MICH. L. REV. ____ (2006) (forthcoming).

⁴³ See Michael L. Katz & Carl Shapiro, *Network Externalities, Competition and Compatibility*, 75 AM. ECON. REV. No. 3, at 424, 424 (1985) (network externality designates circumstance in which “the utility that a user derives from consumption of [a] good increases with the number of other agents consuming the good”).

⁴⁴ See Mark A. Lemley & David McGowan, *Legal Implications of Network Economic Effects*, 86 CALIF. L. REV. 479, 483-84 (1998) (using network effects to include “both like goods and goods compatible with the network”).

exponentially when users apply an identical set of standards.⁴⁵ The possibility of achieving uniform standards to exploit XML's network benefits in corporate contracting requires examination of prevailing practice, embedded in a theoretical account of corporate contracting called transaction cost engineering.

II. TRANSACTION COST ENGINEERING

Corporate contracts are theorized as promoting optimal exchanges by reducing transaction costs and thus facilitating efficient redeployment of assets.⁴⁶ Despite theory, anecdotal evidence suggests that corporate contracting processes can be too complex and empirical evidence shows that resulting contract terms are prone to both oversimplification and excess complexity. XML is an appealing tool to engineer lower transaction costs.

A. Theory and Reality

Contract terms are central to the theory that corporate contracting facilitates optimal results.⁴⁷ Optimality in this context refers to whether terms maximize social welfare measured by the aggregate value of all firms.⁴⁸ The standard form of corporate acquisition agreement illustrates terms useful to promote exchanges on optimal terms. As examples, (1) contingent consideration provisions in merger agreements determine part of the purchase price one year after a transaction closes, resolving ex ante uncertainty and disagreement accompanying negotiations;⁴⁹ and (2) representations and indemnities resolve the dichotomy between facts (that are known or capable of present determination) and forecasts about the future that cannot be known, but whose risk of non-realization is allocated using these contractual devices.⁵⁰ Despite such aspirations, the corporate contracting process sometimes yields terms that contradict the ideal.

⁴⁵ A common measure of the magnitude of network effects (called Metcalfe's Law) estimates them as roughly proportional to the square of the number of existing product users. *See id.* Sometimes this measure is used to predict whether a single standard or purveyor will dominate an application. Domination risk makes critical the role of standard setting for XML applications. *See infra* Part III.

⁴⁶ Examples of corporate contracts are: indentures, credit agreements, preferred stock contracts, shareholder agreements and underwriting agreements; swaps and insurance contracts; licensing and lease agreements; merger agreements, stock purchase agreements and asset purchase agreements; and employment agreements and collective bargaining agreements.

⁴⁷ Ronald J. Gilson, *Value Creation by Business Lawyers: Legal Skills and Asset Pricing*, 94 YALE L.J. 239 (1984).

⁴⁸ *See* Marcel Kahan & Michael Klausner, *Standardization and Innovation in Corporate Contracting (Or the "Economics of Boilerplate")*, 83 VA. L. REV. 713, n. 41 (1997). This measure of optimality is a contestable but widely used heuristic.

⁴⁹ Gilson, *supra* note 47.

⁵⁰ *Id.*

A widely-cited study showed how event risk covenants in corporate bond indentures were intended to compensate investors for credit deterioration, but persistently failed to do so.⁵¹ These covenants provide bondholder rights upon designated adverse issuer events, such as credit downgrades. Three standard remedies appeared: a put option, typically at par (most common), and alternatively, increasing or resetting the interest rate. The remedy of put-at-par endured but was suboptimal (if rates fall or risk declines, a bond's market value increases so the put-at-par under-compensates; if the opposite occurs, and market value decreases, the put-at-par over-compensates). Some firms realized this and responded but, even after those responses, 83% of the sampled covenants provided for the oversimplified put-at-par.⁵²

Along with oversimplification, excess complexity exists. A survey of corporate contracts performed for this Article illustrates excess complexity manifested in alternative definitions of generally accepted accounting principles (GAAP).⁵³ This body of knowledge invariably is used in corporate contracts and is perhaps the most frequently used. Some corporate contracts do not define the term yet use it extensively.⁵⁴ Given that GAAP is well known and widely used, not defining it poses little or no risk of confusion about intended meanings.

Yet many contracts assign definition to GAAP and there is extensive definitional variation across contracts suggesting excess complexity. Many corporate contracts define GAAP using approaches such as restating the obvious by elaborating the acronym (as “generally accepted accounting principles”)⁵⁵ or adding such modest refinements as “in the United States of America”⁵⁶ or “from time to time in effect.”⁵⁷ Others add the words “consistently applied”⁵⁸ (which is a requirement of GAAP and so is redundant) or tie the consistency requirement to financial statements delivered pursuant to the agreement on

⁵¹ See Kahan & Klausner, *supra* note 48.

⁵² *Id.*, at 751.

⁵³ Examples are drawn from University of Missouri's Contracting and Organization Research Institute (CORI), <http://cori.missouri.edu/index.htm>.

⁵⁴ *E.g.*, CORI Contract ID: 38510 | Filing Company: NORTEL NETWORKS CORP. | Accounts Payable Financing Agreement - Impsat SA, Nortel Networks Ltd. (March 25, 2003).

⁵⁵ CORI Contract ID: 34486 | Filing Company: THERASENSE INC. | Agreement and Plan of Merger-Abbott Laboratories, Corvette Acquisition Corp., Therasense Inc. (Jan. 12, 2004).

⁵⁶ CORI Contract ID: 34755 | Filing Company: NATIONAL ENERGY GROUP INC. | Credit Agreement - NEG Operating, Mizhuho Corporate Bank and Others (Dec. 29, 2003).

⁵⁷ CORI Contract ID: 16028 | Filing Company: PRIMEENERGY CORP. | Credit Agreement.

⁵⁸ CORI Contract ID: 3198 | Filing Company: ADVANCED MARKETING SERVICES INC. | Revolving Credit Agreement.

its date.⁵⁹ Still others specify the organizations within the United States that ordain GAAP⁶⁰ or expressly capture not only “established standards” but also “recognized practices.”⁶¹

More intricate variation qualifies the GAAP definition by stating: “for all periods after the date hereof so as to properly reflect the financial condition, and the results of operations and changes in the financial position, of the [designated party].”⁶² These requirements essentially state GAAP’s main purposes, making the clause redundant.⁶³ Another intricacy redundantly qualifies the definition by stating as a purported “exception” that accounting principles which standard-setters “require[] to be changed . . . may be changed.”⁶⁴ GAAP is dynamic and changed regularly with specific rules governing transition periods,⁶⁵ making this intricate language unnecessarily complex.⁶⁶

GAAP definitions also show extensive variation by contract type. For example, GAAP definitions within indentures bear greater similarity when this class is compared to definitions within classes of credit agreements or within merger agreements.⁶⁷ A tempting

⁵⁹ CORI Contract ID: 34505 | Filing Company: NEOGEN CORP. | Credit Agreement - Neogen Corporation and Comerica Bank (Nov. 26, 2003).

⁶⁰ CORI Contract ID: 27490 | Filing Company: AMERICAN SKIING CO. | Indenture - American Skiing Company (Nov. 2004).

⁶¹ CORI Contract ID: 34738 | Filing Company: CSK AUTO CORP. | Indenture - CSK Auto, Inc, CSK Auto Corp., Cskauto.com, Inc., The Bank Of New York (Jan. 16, 2004).

⁶² CORI Contract ID: 43284 | Filing Company: GLOBAL ENTERTAINMENT CORP. | Credit Agreement - Global Entertainment Corp. (Nov. 2004).

⁶³ *E.g.*, FASB, STATEMENT OF FINANCIAL ACCOUNTING CONCEPTS, NO. 5, RECOGNITION AND MEASUREMENT IN FINANCIAL STATEMENTS OF BUSINESS ENTERPRISES.

⁶⁴ CORI Contract ID: 43284 | Filing Company: GLOBAL ENTERTAINMENT CORP. | Credit Agreement - Global Entertainment Corp. (Nov. 2004).

⁶⁵ *E.g.*, ACCOUNTING PRINCIPLES BOARD, OP. NO. 20, ACCOUNTING CHANGES ¶¶ 15-17; *see also* LAWRENCE A. CUNNINGHAM, LAW AND ACCOUNTING: CASES AND MATERIALS 43 (2005).

⁶⁶ Such drafting may charitably be appreciated as showing lawyerly prudence and is justified in certain circumstances. *Compare* James H. Fogelson, *The Impact of Changes in Accounting Principles on Restrictive Covenants in Credit Agreements and Indentures*, 33 BUS. LAW. 769 (1978). Nevertheless, it is a context to check for excess complexity. The definition of GAAP is to be distinguished from specific delineation of accounting concepts intended to depart from GAAP. Contract parties sometimes wish to define certain contract terms using such metrics as EBITDA (earnings before interest, taxes, depreciation and amortization), which is not a GAAP concept, or to include within the definition of the term liability obligations such as guarantees which are not included within the GAAP concept of liability.

⁶⁷ Ten examples were haphazardly extracted from each of the five following contract types in CORI, *supra* note 53, <http://cori.missouri.edu/index.htm>, including those cited *supra* notes 54-64: credit agreement, indenture, merger agreement, stock purchase agreement and asset purchase agreement. The sample of indentures shows definitions typified by designation of specific recognized standard setting bodies

way to explain such differences relates to differing contractual purposes of these contract types and related transactional complexities. Though appealing, there is no reason a general definition of GAAP should vary between indentures, credit agreements or merger agreements. GAAP does vary in some circumstances by the nature of an enterprise's operations, but this variation is embedded within GAAP and does not change with transaction type.

Setting aside redundancies appearing in these examples, another possible explanation for varying definitions of GAAP across contract types might invoke bargaining differences. These may vary among contract types. For example, borrowers negotiate indentures with investment bankers whose task is selling bonds to the public without putting firm capital at risk. In contrast, commercial bankers negotiate credit agreements for their own account, putting their own capital at risk. They may be expected to negotiate more favorable contract terms, including accounting terms and therefore the definition of GAAP.⁶⁸

However, my sample of contracts does not support this explanation. Indentures provide at least as much specificity in defining GAAP, including by detailing consequences of changes in accounting principles and specifically requiring consistent application.⁶⁹ As noted, these specifications are redundant because GAAP requires them, but the pattern suggests that bargaining dynamics are not a good explanation for the variation. The same goes for merger agreements, which often provide GAAP definitions using greater brevity than either credit agreements or indentures.

More fruitful explanations are path dependence and the habits of traditional form practice that corporate lawyers follow. Since little turns on GAAP definitions, variation between contract types most likely is a function of what formulation was used in earliest versions of particular contract types. If indentures began using a certain style, when new indentures are created they likely maintain that style; likewise with credit agreements and merger agreements. Such stylistic path dependence also arises within particular law firms, whose original choice of a given expression of a term can continue despite it being either too simple or unnecessarily complex.

Attributes of traditional law firm form practice contribute additional explanation to departures from the transaction cost engineer ideal. Scholars have noted the following factors: (1) switching costs may be high to identify alternative ways to capture accumulated wisdom in contractual terms; (2) search costs to find superior alternatives may be high and prevent locating them; (3) composition and review costs can be

(Financial Accounting Standards Board or Accounting Principles Board) whereas samples of credit agreements and merger agreements do not.

⁶⁸ See Victor Brudney, *Contract and Fiduciary Duty in Corporate Law*, 38 B.C. L. REV. 595, 653-54 (1997).

⁶⁹ It is possible but unlikely that excess complexity in indentures is a trick investment bankers use to fool investors into thinking they are receiving superior contract terms.

minimized by replication of terms despite oversimplification or excess complexity; and (4) when lawyers use forms as departure points, anchoring effects may bias them to rely too much upon inherited terms contained in those forms.⁷⁰ More broadly, traditional form practice exhibits only modest exploitation of modularity and network benefits that XML offers. To see how all these factors and path dependence contribute to departures that XML may be able to correct, consider traditional form practice in more detail.

B. Traditional Form Practice

Traditionally, corporate lawyers prepare contracts using precedent forms that address comparable transactions. Special needs typically are met by adding deal-conforming provisions from other precedent contracts. Even when lawyers concoct new language for deal-specific circumstances, they invariably do so with reference to extant forms. In these exercises, lawyers mark-up such drafts to direct changes, as by hand writing on the paper <insert contingent consideration provisions from the Bank of America deal>. For many corporate lawyers, “it is hard to imagine drafting any other way.”⁷¹

Locating suitable precedent documents can be expensive and involve numerous steps. Search costs are reduced by repositories of precedent documents, including Westlaw, LEXIS, the SEC’s EDGAR system and University of Missouri’s new Contracting and Organization Research Institute (CORI).⁷² However, the level of specification in such repositories is high, discriminating between filing types (such as proxy statement or annual report) and the kinds of exhibits attached (such as indenture or merger agreement). They do not distinguish into clause types, such as definitions or representations.⁷³ Forms and precedents are thus linear rather than modular: they appear as full-length contracts read page-by-page, not clustered by clause type. This can

⁷⁰ See Claire A. Hill, *Why Contracts are Written in “Legalese”*, 77 CHI.-KENT. L. REV. 59 (2001); Kahan & Klausner, *supra* note 48.

⁷¹ See Hill, *supra* note 70.

⁷² CORI was created in 2003 as a repository of corporate contracts, mostly culled from EDGAR; it is superior to other repositories because it is easier to search (it also is free) <http://cori.missouri.edu/index.htm>. The World Bank Group hosts a database providing links to “government and regulatory agency websites in developing countries that contain contracts and licenses used to regulate the provision of infrastructure services, including electricity, telecommunications, transportation, and water and sanitation.” *Id.* See <http://ppi.worldbank.org/icl/index.asp>. Numerous purveyors of standard form contracts offer products over the Internet. *E.g.*, <http://standardlegal.net>; www.uslegalforms.com; www.consusgroup.com; www.lawdepot.com.

⁷³ Financial information in SEC filings increasingly is tagged to useful levels of specificity. Some filers use XBRL, which enables computers to parse documents to extract and manipulate data. See *supra* text accompanying notes 16-17; Aaron J. VanGetson, Note, *Real-Time Disclosure of Information Via the Internet: Real Time or Not Right Now?*, 2003 U. ILL. J. L. TECH. & POL’Y 551, 565-567. The proprietary EDGAR Online system is an example of one service that enables customers to extract and manipulate accounting information from SEC filings. See <http://www.edgaronline.com>.

contribute to bogging down negotiations when lawyers disagree about what terms are “standard.”⁷⁴

Making changes often entails creating numerous internal cross-references in contracts. The nature of form-based word-processing databases tends to bias lawyers towards tailoring by adding text to contract drafts not subtracting text. While sometimes longer contracts are more effective—and even simpler—they also can contribute to increased complexity by requiring more internal cross-references or qualifications (illustrative is the ubiquitous “notwithstanding anything in this agreement to the contrary . . . ,” a highly complex phrase because potentially interactive with every other term in the agreement).⁷⁵

Delineating contingencies compounds complexity when this creates variation compared to comparable terms in other contracts (as the examples of GAAP definitions in the preceding Section suggest).⁷⁶ Lawyers identify future possibilities and design intricate contractual mechanisms to address them. Reflecting trends in legal culture, corporate lawyers increasingly draft contract terms bearing qualities of rules rather than of standards in order to limit the range of discretion available to persons later charged with interpreting contract language.⁷⁷ Such inclinations to tailor terms can be desirable but often are unnecessary. Doing so can be particularly costly when lawyers preparing contracts simultaneously prepare public disclosure describing their terms and must keep the two in sync.⁷⁸

Lawyers recognize the complexity of the contracting process and resulting terms and manifest numerous efforts to reduce both. As to process, resourceful law firms maintain form catalogues. Often, a single document file in a word processing format contains numerous variations of many of the standard but modified terms, in a modestly modular format. For example, the representations section of a law firm’s standard form of credit agreement may contain numerous alternative approaches to handling specific items. The form may annotate the alternatives. Annotations explain the choices and cite

⁷⁴ See Stephen I. Glover, *Indemnification Provisions in Acquisition Agreements: Is There Such a Thing as Standard Practice?*, 14 CORP. COUNSEL WEEKLY (BNA) 8 (May 5, 1999).

⁷⁵ See Hill, *supra* note 70; see also Claire A. Hill & Christopher King, *How Do German Contracts Do as Much with Fewer Words?*, 79 CHI.-KENT L. REV. 889 (2004).

⁷⁶ See Karen Eggleston, Eric A. Posner & Richard Zeckhauser, *The Design and Interpretation of Contracts: Why Complexity Matters*, 95 NW. L. REV. 91 (2000); see *supra* text accompanying notes 53-66 (GAAP definition illustrations).

⁷⁷ See William W. Bratton, Jr., *Rules Versus Principles Versus Rents*, 48 VILL. L. REV. 1023, 1050-51 (2003); see also Cass R. Sunstein, *Problems with Rules*, 83 CAL. L. REV. 953 (1995).

⁷⁸ This occurs, for example, when parties negotiate a public indenture they simultaneously prepare a prospectus describing its terms. This exercise can be cumbersome and presents risk of discrepancy between the contract and the disclosure. *E.g.*, *Adams v. Standard Knitting Mills*, 623 F.2d 422 (6th Cir.), *cert denied*, 449 U.S. 1067 (1980). Error risk increases with greater contractual specificity.

precedent deals where alternatives appeared. Still, these catalogues tend to be organized by contract type (such as credit agreement) not clause type (such as financial statement representation).

Standard contract forms generally show uniform length by contract type, with voluminous schedules and other accompanying materials fleshing out transaction-specific details.⁷⁹ Particular contract types exhibit substantially similar structures, another modest nod at modularity. Maintaining similar architecture promotes simplicity by reducing composition and review costs (often referred to in the literature as writing and reading costs). For example, merger agreements typically follow the same order of provisions and indentures tend to follow the standard form published by the American Bar Association.⁸⁰ Kindred architectures appear in asset and stock purchase agreements and many others.⁸¹ Greater architectural variation appears across contract types, however.

As for simplifying contract terms, corporate contracts that use specific terminology usually begin with a section providing definitions or define terms upon first use. Providing definitions reduces a contract's internal interactions. A general definition of GAAP makes repeated invocation of accounting terms simpler than it would be to define each accounting term when used. Especially good candidates for specific definition are terms used throughout a contract, minimizing cross-references. Despite recognition of these conventional points, best practices are not always followed and defined terms can persistently show excess complexity (as with GAAP).

Lawyers draft corporate contracts knowing that there is risk of judicial interpretation error. Judicial attitudes towards interpretation can pressure lawyers to

⁷⁹ Some arrangements, such as financial derivative contracts, contain two components: a master agreement elaborating general provisions and a series of individual take-downs. This likewise illustrates effort to simplify complexity: the master presents a template of simplicity, with complex tailored terms allocated to take-downs. Take-downs specify discrete economic terms of an exchange (in the case of swaps, notional amount, underlying item being hedged, rates, timing of payments, duration and so on). *See also* ABA Task Force on EDI, *supra* note 26 (ABA Task Force approach to contracts formed using electronic data interchange of providing a master agreement that contemplated subsequent takedowns for discrete transactions amid an ongoing long-term relationship).

⁸⁰ The standard pattern of merger agreements reflects: structure and timing of the deal, representations, covenants, conditions, termination, indemnification, and miscellaneous. *See* DALE A. OESTERLE, *THE LAW OF MERGERS AND ACQUISITIONS* 326-34 (3d ed. 2005). The standard pattern of indentures reflects: a definitions section followed by terms, representations, covenants, events of default, trustee duties, special features such as convertibility or subordination and miscellaneous. *See* American Bar Association, *Section on Business Law, Revised Model Simplified Indenture*, 55 BUS. LAW. 1115 (2000). The American Bar Foundation once published a model indenture but this is out of date.

⁸¹ *See, e.g.,* Terry W. Gentle, Jr. & Joan MacLeod Heminway, *Buying Stock in Tennessee: An Annotated Model Stock Purchase Agreement*, 5 TRANSACTIONS: TENN. J. BUS. L. 211 (2004); Angela Humphreys Hamilton & Joan MacLeod Heminway, *Buying Assets in Tennessee: An Annotated Model Asset Purchase Agreement*, 4 TRANSACTIONS: TENN. J. BUS. L. 209 (2003).

achieve linguistic precision to close gaps.⁸² Interpretive disputes have arisen over such matters as the scope of protection afforded bondholders in respect of a corporation's creditworthiness arising from its capital structure⁸³ and the meaning of clauses triggered upon the occurrence of a "material adverse change."⁸⁴ Some courts emphasize the importance of judicial respect for standardized terms to reduce associated uncertainty.⁸⁵ This encourages lawyers to stick with boilerplate terms, which can oversimplify; yet lawyers cannot count on this judicial attitude, and this uncertainty can produce excessively complex terms.

In a smaller but important class of contexts, lawyers face risk of regulatory override. Some regulators are empowered to reject the enforceability of certain types of contract clauses. Consider the United Kingdom's Panel on Takeovers' authority to reject certain clauses in merger agreements, such as material adverse change conditions.⁸⁶ The Panel can strike clauses when too broadly phrased (because they impair reasonable expectations of merging company shareholders to achieve consummation of a transaction).⁸⁷ Regulatory risk encourages standardization in clauses, given that even modest tailoring to suit desires of contracting parties may fail.⁸⁸

Traditional form practice exhibits a limited dose of network externalities.⁸⁹ When more users employ the same contract language, resulting standardization yields benefits to existing and subsequent users. This effect is most stark when contested clauses receive specific judicial interpretation that settles or narrows meaning or when regulatory authorities rule certain clauses acceptable or unacceptable. Less formally, this effect arises from negotiations and informal dispute resolution followed when participants discuss the meaning of particular clauses. Modest network effects are thus one benefit

⁸² See generally Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L.J. 87 (1989).

⁸³ E.g., *Metropolitan Life Ins. Co. v. RJR Nabisco*, 716 F. Supp. 1504 (S.D.N.Y. 1989).

⁸⁴ E.g., *In re IBP S'holders Litig.*, 789 A.2d 14, 21 (Del. Ch. 2001), *motion for vacatur denied*, 793 A.2d 396 (Del. Ch. 2002).

⁸⁵ See, e.g., *Sharon Steel Corp. v. Chase Manhattan Bank, N.A.*, 691 F.2d 1039, 1048 (2d Cir. 1982) (Winter, J.).

⁸⁶ See THE PANEL ON TAKEOVERS AND MERGERS, Rule 13; see also CONSULTATION PAPER ISSUED BY THE CODE COMMITTEE OF THE PANEL, CONDITIONS AND PRE-CONDITIONS (Aug. 10, 2004). The status of the London body is to be adjusted in late 2006, after the United Kingdom implements the European Directive on Takeovers.

⁸⁷ See *Takeover Code Revision Proposals*, FIN. T. (Aug. 11, 2004).

⁸⁸ See also *infra* text accompanying notes 230-231 (cultural implications of XML in corporate contracting amid globalization).

⁸⁹ See Kahan & Klausner, *supra* note 48 (also studying how these network externalities may present risks of lock-in on sub-optimal terms); *supra* text accompanying notes 43-45.

achieved through the various efforts lawyers use to minimize transaction costs of corporate contracting in traditional form practice. Yet they may also produce negative network externalities when the result is over-standardization on sub-optimal terms.

Harnessing XML to corporate contracting may produce superior network effects and overcome other limitations of traditional form practice. To analyze that possibility, a sharper statement of the problems manifested in traditional form practice might be useful. The foregoing discussion illustrated and explained the presence of terms that are too simple or too complex but without providing a specific way to measure these deficiencies. While doing so is difficult—for example, conventional attempts assume an ascertainable measure of optimality such as the aggregate value of all firms⁹⁰—the important outlines can be sharpened by sketching an abstract model of contracting complexity.

C. Contracting Complexity

A general model of contracting complexity must take a conceptual and somewhat formal approach.⁹¹ This recognizes how notoriously difficult measuring complexity is.⁹² A basic characterization emphasizes a large number of internal interactions within a system (say a contracting process or contract term). Complexity and simplicity define a continuum according to the relative degrees of involvement in a contracting process or contract term.⁹³ Sophisticated models use graph theory to depict those internal interactions with nodes and measure complexity according to the number of interactions per node.⁹⁴ Similarly ambitious models in computational complexity theory measure the time required to run programs to solve specified problems.⁹⁵

⁹⁰ See *supra* text accompanying note 48.

⁹¹ Compare Eggleston, Posner & Zeckhauser, *supra* note 76; Louis Kaplow, *A Model of the Optimal Complexity of Legal Rules*, 11 J. L. ECON. & ORG. 150 (1995); Peter H. Schuck, *Legal Complexity: Some Causes, Consequences, and Cures*, 42 DUKE L.J. 1 (1992).

⁹² See R. George Wright, *The Illusion of Simplicity: An Explanation of Why the Law Can't Just Be Less Complex*, 27 FLA. ST. U. L. REV. 715 (2000); Craig J. Albert, *The Deceptive Allure of Simplicity*, 26 SETON HALL L. REV. 1414 (1996).

⁹³ Complex is to be “composed of parts,” from the French *complexe* and the Latin *complexus*, meaning surrounding or encompassing. *Com* means with and *plectere* to weave, braid, twine and together, “not easily analyzed.” Simple is “mere or pure,” the opposite of complex, from the French *simple* and the Latin *simplex*, meaning single. Simple is a variant of simplex which means characterized by a single part, in Latin *simplex* (*sem* denoting one or together and *plac* fold). Simple is “one-fold” compared to complex which is “manifold” (varied in appearance). See Online Etymology Dictionary, www.etymonline.com.

⁹⁴ See Smith, *supra* note 42, [draft at pages 11-12].

⁹⁵ See Eric Kades, *The Laws of Complexity and the Complexity of Laws: The Computational Complexity Theory for the Law*, 49 RUTGERS L. REV. 403 (1997).

For contracting, relative complexity has three dimensions: substantive content of a transaction; the contracting process; and contractual expression in terms. Substantive transaction content refers to features of an exchange such as the items transferred (say an inventory component in a manufacturing application, cash in an institutional lending arrangement or a business enterprise in an asset purchase transaction). The relative complexity of such an exchange may be approximated by the number of attributes associated with such features. Transactional complexity establishes a certain inherent complexity for the relevant contracting process and contractual expression in terms.⁹⁶

Given transactional complexity, a question is whether associated processes and contractual expression are more complex or simpler than necessary. Process complexity can be estimated either by the number of interactions required to achieve contract formation or the length of time required or a combination. Relatively simple is the purchase and sale of an inventory component while merging industrial corporations invariably is complex. If more interactions occur or time is used than necessary to obtain the same substantive result (such as so much quantity at a desired price), the process exhibits excess complexity.⁹⁷

Contract term complexity can be approximated in two ways. First, it can be measured according to the number of interactions a given term has with other terms in a contract. Terms can be graphed to depict these interactions and measured according to conventional graph theory techniques. Under this approach, most boilerplate terms would qualify as relatively simple when these provisions bear few interactions with other contract terms. So measured, idiosyncratic terms may or may not be complex.

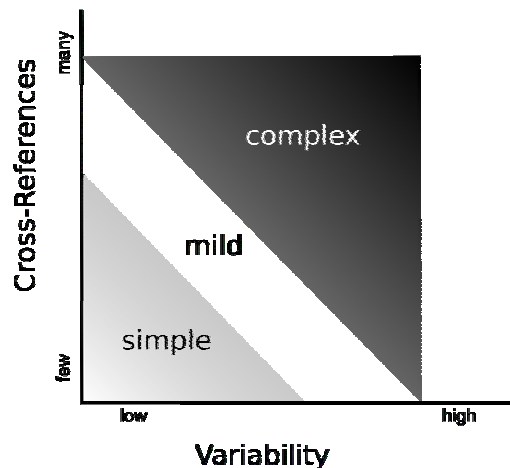
Second, contract term complexity can be approximated according to the degree of variability in a given term compared to uses of that term in other contracts. Most boilerplate terms likewise meet the definition of simplicity using this measure, given how they are characterized by high standardization. Under this approach, idiosyncratic terms would invariably be classified as complex, even if their actual contractual content is otherwise straightforward. The complexity measured is unusualness, which might be a good proxy because associated reading and writing costs (and interpretation or override risks) are high.⁹⁸

⁹⁶ For example, fewer steps are necessary to transfer an inventory component than make a loan and more are necessary to transfer assets of an entire business than in either of these. Contract documentation bears a roughly proportional relationship to underlying transactional complexity.

⁹⁷ This can be reduced through better telecommunications capability, data processing, contract drafting, document production and contract administration. It should resist oversimplification, which can arise from insufficient searching for best terms in inventory purchase transactions or, in corporate mergers, from inadequate due diligence, facile drafting or truncated negotiations. *See, e.g., In re Cendant*, SEC AAER No. 1272 (June 14, 2000) (elaborate financial scandal uncovered following merger); *compare In re Telxon Corp.*, SEC AAER No. 1511 (March 5, 2002) (irregular accounting discovered during pre-merger due diligence).

⁹⁸ Term complexity could be decomposed further to identify more finely-rendered components. For example, term complexity could be assessed according to how many contingent future states of the world a set of contract terms contemplates and how variable resulting consequences are from those alternatives.

A term complexity index can be constructed by combining the two measures of internal interaction and external variability.⁹⁹ A term is relatively simple if minimally cross-referenced internally and appears with limited variation in associated contract types. Governing law clauses are an example of this class.¹⁰⁰ A term is relatively complex if it is cross-referenced intensively within a contract and varies extensively across associated contract types. Definitions of certain financial terms illustrate this class. A term is mildly complex if cross-referenced intensively or if it shows extensive variation across associated contract types.¹⁰¹ The following graph captures the term complexity index so conceived.



The graph reflects two intuitions about contract drafting. First, a cardinal principle of contract drafting prescribes using cross-references sparingly and warily.¹⁰² Following this principle, terms should ideally drive toward the *southern half* of the graph. Second, harmonizing contractual content with concordant language used in comparable contracts

But these finer features, and more, are captured by the broader sense of complexity and simplicity approximated by intensive cross-reference and extensive term variation across contracts. *Compare* Eggleston, Posner & Zeckhauser, *supra* note 76, at 99-100 (providing finer components and an estimate of “cognitive load” that “overlaps” with the dimensions I am capturing, which denote “something more”).

⁹⁹ A process complexity index can be constructed in parallel fashion. A process is *simple* if it involves few steps and is not time-consuming. One-shot goods purchases exemplify. A process is *complex* if it involves multiple steps and extended time. Business mergers illustrate. A process that is involved or time-consuming but not both has *mild complexity*.

¹⁰⁰ See Smith, *supra* note 42, at ____.

¹⁰¹ Variation is contextual. Certain terms—such as quantity, price or interest rate—vary across contracts, but are *invariably* expressed numerically. Such numerical expressions should be seen as simple terms. When conjoined with a formula to determine results, however, they may lose this simple character. For example, interest rates computed according to a financial model driven by LIBOR and calculated on a rolling basis become mildly complex.

¹⁰² See REED DICKERSON, THE FUNDAMENTALS OF LEGAL DRAFTING § 8.31, at 198 (2d ed. 1986).

is an important explanation for the existence of boilerplate terms.¹⁰³ Following this explanation, one would expect terms to drive toward the *western half* of the graph. Taking the points together, terms would congregate towards the *southwestern quarter* (including within the band designated mild). These intuitions and expectations reflect a preference for simplicity to complexity that is normatively desirable—so long as terms are not oversimplified.¹⁰⁴

The graph provides guidance to search for terms that may be oversimplified or excessively complex. Terms potentially capable of being simplified congregate towards the complex zone in the *northeast corner* of the graph (the definition of GAAP is an example, when extensively cross-referenced). Terms that are potentially oversimplified congregate towards the simple zone in the *southwest corner* of the graph (governing law clauses can be an example).¹⁰⁵ Of course, not all terms so residing will be too simple or too complex. For example, terms throughout the eastern half of the graph may simply reflect innovation or experimentation and those throughout the western half an emerging consensus that resolves underlying uncertainty. But those zones are good places to look for such corrective needs.

Discovering candidates for corrective attention is improved by examining a relatively large population of alternatives. This is important in the oversimplified risk category to increase the probability of finding at least one instance with some variation or multiple cross-references; it is important in the excessively complex risk category to find at least two instances that show low variation or few cross-references. On this basis, by hypothesis, terms exhibiting mild complexity are more likely than the other categories to be optimal, so fewer instances would be necessary to confirm the hypothesis. Also by hypothesis, as oversimplified or excessively complex terms are corrected for these deficiencies, they increasingly move towards the graph's band designated as mild (especially within the portion of that band residing in the graph's southwestern quarter).

Contracting is dynamic, so term population distributions across the graph would change endlessly. Nevertheless, once corrected, terms remaining in the southwest corner may be considered maturely standardized terms; those remaining in the northeast corner may be considered idiosyncratic terms. Moreover, the term complexity index could

¹⁰³ See Smith, *supra* note 42.

¹⁰⁴ See RICHARD A. EPSTEIN, *SIMPLES RULES FOR A COMPLEX WORLD* 21, 28 (1995). Two caveats apply. First, some participants may deliberately use complexity or oversimplification for strategic gain. See Michelle E. Boardman, *Contra Proferentem: The Allure of Ambiguous Boilerplate*, 104 MICH. L. REV. ____ (2006) (forthcoming). The statement does not necessarily preclude such uses, however, because both remain susceptible to strategic exploitation. See Robert B. Ahdieh, *The Strategy of Boilerplate*, 104 MICH. L. REV. ____ (2006) (forthcoming). Second, lawyers may engage in experimentation during transition periods to determine whether results are optimal.

¹⁰⁵ These are rarely cross-referenced and routinely state a single jurisdiction (as in “this Agreement shall be governed by New York law”) yet often could benefit from finer distinctions (such as that “this Agreement shall be governed by New York law except with regard to its conflicts of laws provisions” or that “this Agreement shall be governed by New York law except with regard to the fiduciary duties of the Company’s directors, which shall be governed by Delaware law”). Compare Smith, *supra* note 42.

measure the relative complexity of particular contracts at given times. This could be useful in numerous exercises, such as assigning professional tasks among members of a transaction team. It could facilitate analyzing how much value lawyers add through superior term drafting compared to other services (such as transaction design or due diligence investigations). Ultimately, these and other potential uses of the term complexity index can help to assess the susceptibility of varying contract types to exploitation of XML's prospects.

D. XML's Prospects

To reduce transaction costs associated with over-simplification or excess complexity in corporate contracting, an intuitively appealing prescription would develop a superior method of arranging precedent resources. Rather than use traditional documentary precedents that pose risks of over-simplification and excess complexity, the approach would treat clauses as modular. These would be serviceable for varying contracting contexts and would make multiple alternatives more visible than traditional form practice enables. This vision would differ markedly from existing law firm form catalogues or repositories such as SEC EDGAR, LEXIS, Westlaw and CORI.

True, existing tools could simply be reorganized in their current word processing file formats. But building an XML-based repository could be superior. Either project would entail significant up-front costs. Reorganizing existing information using word processing tools would entail an elaborate cut-and-paste exercise; harvesting and tagging a large population of precedents using XML would involve a more substantial undertaking. Ongoing costs would differ radically, however. A reorganized word-processing database would require updating following the same cut-and-paste exercise. An XML collection could be updated automatically: tags used to classify contractual content can be parsed by computers on a regular basis and sorted into the repository.

An XML-based repository of contracts would organize contract terms as modules. Traditional contract-type classifications could remain useful for specialized functions (such as asset purchase agreements and stock purchase agreements or indentures and credit agreements). More effective is classification of clauses common to all these, such as definitions of GAAP or representations about various business characteristics. This modular organization reflects how, at a meaningful level of generality, such exchanges are functional equivalents. For example, either sort of purchase agreement is equivalent to a credit agreement or indenture if one conceptualizes a lending arrangement as involving essentially a sale of cash. Contracting parties in many different normative categories (such as buyers, sellers, lenders and borrowers) need similar assurances obtained through similar contract terms.

Goals in creating such a repository—hereinafter called a KXML Library¹⁰⁶—are to reduce transaction costs of corporate contracting by (1) simplifying processes and (2)

¹⁰⁶ Lawyers—and law students—commonly use K as an abbreviation for “contract.” Compare *supra* note 15 (noting how some XML developers treat the *x* in XML as an algebraic variable).

reducing complexity of resulting terms, in each case, without oversimplifying. Evaluating these possibilities requires exploring what terms a KXML Library would contain and the process of determining how they are used. Take the process first—assuming for the moment a population of terms drawn from extant precedents in a manner discussed momentarily.

1. *Process*. The KXML Library presents a user interface template. Rather than composing contracts with pen-and-paper using word processing precedents, in the KXML Library, lawyers access the database electronically. They first input the major agreed features of a transaction to be governed by a contract. This would be read from a traditional term sheet. One component of this step is designation of the contract type (such as merger or credit agreement).

For each major section, the KXML Library offers a menu of alternative provisions. These begin with ministerial features such as title, parties, dates and signature pages. They proceed through various definitions, including the definition of GAAP for example, and then through representations, covenants and conditions. For designated transaction types specialized menus appear, such as contingent consideration provisions for business combinations or event risk covenants for bond indentures. Within each section, paragraphs and clauses drop down to illustrate alternatives.

In XML-based composition, lawyers begin by working through computer prompts to select desired versions of the section, paragraph and clause categories. When the selection process is completed, the lawyer directs a computer to compose the contract. The computer does so and the lawyer reviews the resulting draft for comportment with desired transactional features. The lawyer then exercises traditional professional judgment to assure suitability of various clauses and internal consistency. The lawyer is free to add or change any and all clauses using resources from within or outside the KXML Library or drafting tailored provisions from scratch.¹⁰⁷

Counterparties using XML see the provenance of proposed clauses.¹⁰⁸ This enhances ability to determine whether particular clauses and the overall draft suit their transactional needs. Proposed points for negotiation would be retrieved from the KXML Library and, as with the first draft, from non-Library precedents or original drafting. Negotiations informed by content from the Library simplify by giving parties a uniform

¹⁰⁷ See Marc Lauritsen, *Knowing Documents* (June 1993). Additions are necessary when legal or market realities change. An example is how many corporate contracts included representations and covenants as to financial matters after passage of the Sarbanes-Oxley Act of 2002. These mostly concerned newly-required officer certifications concerning the effectiveness of internal controls over financial reporting.

¹⁰⁸ Once satisfied with a first draft, the preparing lawyer transmits it to her client for review, discussion and, subject to resulting revisions, approval. She forwards the proposed draft to the other side and its counsel. This can be transmitted in print form by hand, if desired, or electronically. If transmitted electronically, document format could be either a word processing format or an XML format. If in print or word processing format, the other side proceeds with its review and proposed changes in traditional form practice fashion. Firm use of XML promotes network benefits, which increase as more firms use it.

frame of reference. This reduces costs that arise when lawyers haggle over which approach to a transaction issue is “standard.”¹⁰⁹ Composition and revision are facilitated by Library design features that give lawyers on both sides ability to choose, add, subtract and rearrange terms while maintaining contract coherence.¹¹⁰ For contracts required to be described in public filings, such as with the SEC, the KXML Library’s narrative content could be combined with XBRL-type SEC filing tools to create automatic comparison and coordination of contracts with required disclosure about them.¹¹¹

XML-based corporate contracting thus contrasts with anxiety provoked by XML-based commercial contracting. Anxiety arises, in part, from issues associated with contract formation, assent, linguistic misunderstanding and customs.¹¹² For XML-based corporate contracting as I have envisioned it, these problems are reduced. Contract formation and assent occur in the traditional manner. Computers do not complete the transaction; instead, computers are used during drafting. Problems of linguistic expression likewise do not bear on ultimate contract terms or their interpretation. Parties sign off on express actual contracts, assenting to language that they approve, though derived in ways that differ from existing contracting processes. Similarly, matters of custom appear in corporate contracting using XML not through the resulting contractual instrument, but during drafting and bargaining.

2. *Terms.* Turn attention to the term content of the KXML Library. As an initial matter, all extant contracts and clauses may theoretically be assembled into the database. This may be impractical. Although a large number should be harvested, choices must be made, both as to contracts and clauses. A danger appears. While a useful KXML Library enables seeing more types of clauses assembled into modules, the *ex ante* selection process may result in choices that over-standardize terms. Too few alternatives within a given menu, due to selection or classification error, would threaten repeated use of sub-optimal terms—meaning oversimplification.

Promoting optimal classification and term content of a KXML Library can be facilitated by refined versions of the term complexity index introduced in the preceding Section. This used two measures of complexity (internal cross-reference and external

¹⁰⁹ See *supra* text accompanying note 74.

¹¹⁰ Design features may be denominated as: decomposition, substitution, augmentation, exclusion, and inversion. See Smith, *supra* note 42, [draft at 24-26] (identifying these features which I summarize here). Decomposition enables contract clauses in the KXML Library to be broken down into autonomous components, according to natural categories, such as definitions or representations. Substitution enables choosing terms so that alternatives for that term type perform the same function within the framework of the rest of the contract; augmentation facilitates the complement of substitution: adding terms that harmonize with the overall contract. Exclusion facilitates the opposite of these: leaving a term out without disrupting other contract modules. Inversion refers to capacity to move modules around, as by relocating a term defined in a substantive section into a separate definitions section.

¹¹¹ See *supra* note 78 and accompanying text.

¹¹² See *supra* text accompanying notes 30-38.

variability) to classify terms as simple, complex or in between (mild). It and more refined tools can be applied to help define Library content necessary to yield optimal populations. For example, both simple terms and complex terms require more alternative illustrations compared to mildly complex terms. As noted, the term complexity index also can be used in assembling content to determine which terms—and contracts—are most likely to be susceptible to maximal use of the KXML Library and which will depend more on original drafting contributions tailored to particular agreements.

While the term complexity index can assist in managing a KXML Library's term content, no algorithm will displace the value of judgment and experience in determining such content. Indeed, care also would have to be exercised to assure that Library content contained varying strengths of certain clauses to meet varying trade-offs people face in differing bargaining contexts. That is, there rarely will be a single uniform entry for any given clause type in the XML Library (although having a single XML Library is essential to maximize network benefits).¹¹³ Lawyers would choose among alternative offerings. Haggling would occur with reference to alternatives (and with reference to original drafting). Accordingly, recognizable concepts, such as a "buyer's clause" or a "seller's clause," would endure.¹¹⁴

The choices inherent in the Library's development may be analogized to preparation of *Restatements of Law*. When the American Law Institute undertakes *Restatement* projects, members decide whether to restrict effort to a positive account of existing law or to contribute normative direction.¹¹⁵ The term content of a KXML Library could be restricted to extant contract terms as a pure restatement or could incorporate original drafting modifications bearing a more prescriptive quality. To promote the service's integrity, it likely is best for participants to restrict themselves to mechanical rendition rather than original drafting. But to the extent practical constraints require choices, selecting extant terms for inclusion entails a normative dimension.

Moreover, despite the image of an improved store of knowledge subjected to lawyerly judgment, a KXML Library could assume a power of its own. New contracts draw on existing contracts in the Library. If this reduces lawyer incentives to provide tailored terms when necessary, over-simplification risk increases. Lawyers also could choose terms that sustain rather than eliminate excess complexity. This power also could induce lawyers—and clients and counterparties—into false complacency that computer-generated drafts are superior to alternatives lawyers could invent to meet client and transaction needs. Such complacency provokes concern that this tool stifles creativity and promotes rigidity.

¹¹³ See *supra* text accompanying notes 43-45.

¹¹⁴ Proposed contract terms often play a discovery function by inducing a counterparty proposing revisions to explain why by disclosing information. This is common in many contexts, including especially credit agreements and merger agreements. Useful disclosure-triggering clauses would have to be available in the KXML Library.

¹¹⁵ E.g., E. ALLEN FARNSWORTH, *CONTRACTS* 26 (1990).

This concern is theoretically justified as to terms addressing new developments requiring experimentation and as to terms that are not maturely standardized (those correctly congregating outside the term complexity index's southwest corner). For those, room remains for innovation. To address this, the KXML Library would be dynamic, not static. New contracts would routinely be parsed for rendition into the KXML Library, supplying an endless refreshment feature. This refreshment feature entails constant recycling of new contract terms, with lawyerly variance reflected, to negate rigidity. It distinguishes the KXML Library from traditional form based practice (and sharply contrasts with fill-in-the-blank contract forms). They are essentially opposites: the Library facilitates creativity by its continuous harvesting of new contracts.

The refreshment feature's value depends, in turn, on how it compares with traditional form-based practice. Form-based drafting is linear. It begins with a lengthy document containing a single rendition of each component. Repeated use of a sub-optimal term is due to over-simplification owing, in turn, to inherent problems of traditional form practice such as absence of ability or resources to identify alternative optimal terms or associated cognitive biases.¹¹⁶

Addressing cognitive limitations, XML's modularity makes XML-based contracting nonlinear: drafting composition begins with a host of alternatives for the content of Article One followed by a host of alternatives for each ensuing Article, through Ten (say).¹¹⁷ This arrangement is structured into modules that are more congruent with recognized cognitive structures of the human mind.¹¹⁸ Increased correspondence between lawyer activity and cognitive structure suggests that XML-based corporate contracting can be superior to traditional form practice, including by resisting oversimplification.¹¹⁹ Easily viewed alternatives also enable lawyers to see excess complexity and eliminate it over time, making the Library's refreshment feature robust.¹²⁰

XML-based corporate contracting thus promises realization of quests that contract drafting experts have imagined since the dawn of the computer age in the 1970s. In that era, the American Bar Foundation pioneered computerized contract assembly techniques

¹¹⁶ See *supra* notes 70-88 and accompanying text.

¹¹⁷ Cf. SCHNEIDER, ELECTRONIC COMMERCE, *supra* note 6, at 75 (discussing Web page design as linear or nonlinear).

¹¹⁸ See JERRY A. FODOR, THE MODULARITY OF MIND (1983).

¹¹⁹ See Smith, *supra* note 42, [draft at 29] ("The human mind . . . finds modular structures much easier to deal with cognitively.").

¹²⁰ Cf. Kevin E. Davis, *The Role of Nonprofits in the Production of Boilerplate*, 104 MICH. L. REV. ____ (2006) (forthcoming) [draft at 16] ("technology that makes it possible to compare documents and highlight differences between them electronically at the touch of a button almost certainly reduced the costs of switching between closely related contracts").

that emphasized the value to lawyers of presenting standard contract terms in a “normalized form” (an “intensively paragraphed format”) to “head off omissions and ambiguities of modification and useful also in tying in with a computer.”¹²¹ Studies showed how such tools enabled lawyers to “understand substance faster” and “deal with syntactic ambiguities that [he or she] might otherwise overlook.”¹²²

Promoting lawyer ability and resources to identify optimal alternatives makes critical the initial definition of structure and content (that is, the process of XML tagging). This defines determinate matters of module content and sequencing and establishes a vocabulary that computers and people then use in contract composition. As a language, XML must be appreciated for its power to control the range of contractual expression and alter the nature and norms of corporate contracting.¹²³ Some fear that its linguistic attributes resemble George Orwell’s *Newspeak*.¹²⁴ A less jarring characterization would equate it with non-natural languages such as GAAP.¹²⁵ Even if XML more nearly resembles non-natural languages such as GAAP, the power requires attention to leadership in standard setting to develop it.

III. STANDARD SETTING

Developing a KXML Library requires an unusual combination of skills.¹²⁶ First, technology skills are essential to craft schemas that reliably define document types.¹²⁷

¹²¹ DICKERSON, *supra* note 102, at 261 (citing Sprowl, *Automating the Legal Reasoning Process: A Computer that Uses Regulations and Statutes to Draft Legal Documents*, 1979 A.B.F. RES. J. 1; Allen & Engholm, *Normalized Legal Drafting and the Query Method*, 29 J. LEG. EDUC. 380 (1978)).

¹²² DICKERSON, *supra* note 102, at 262.

¹²³ For example, traditional practice holds that once a point has been resolved, it is inappropriate to revive it. With a KXML Library, a later-discovered provision held out as the standard term may be game for suggestion even after the point was otherwise resolved.

¹²⁴ See Edward L. Rubin, *Computer Languages As Networks and Power Structures: Governing the Development of XML*, 53 SMU L. REV. 1447 (2000).

¹²⁵ Much of GAAP is written in natural language, but it also is a highly specialized vocabulary that includes schemas, such as how information is classified within financial records, where results appear in financial statements, and how various items are presented. See Shyam Sunder, *Rethinking the Structure of Accounting and Auditing*, 7 INDIAN ACCOUNTING REVIEW (2003), reprinted in THE ICAI JOURNAL OF AUDIT PRACTICE, www.icfairpress.org (2004) (also available from SSRN.com, June 16, 2003). In these attributes, GAAP is a non-natural language, just as XML is a non-natural language.

¹²⁶ XML schemas and contractual content may not appear to be “standards” in certain senses of that concept (such as fuel efficiency aspirations or building code specifications). Yet if defined as denominating a uniform and articulated or written method or approach, XML schemas certainly qualify as standards and, when conceived as a recognized or designated functional text, clause content does too. See also *supra* text accompanying note 74 (lawyers haggle about what is “standard”).

¹²⁷ Schemas address matters such as that Article One provides definitions of terms used in the contract, Article Two contains representations of the parties, Article Three contains covenants and so on.

Second, legal expertise and contracting experience are essential to ensure that schemas delineate common categories of information in contracts and that the KXML Library contains sufficient content to command acceptance among corporate lawyers and their clients to promote network benefits.¹²⁸ Third, searching and collection tools are necessary to harness a sufficient contract collection, meaning capability of tapping existing repositories. Fourth, ability to assure ongoing maintenance and development is essential to maintain the Library's refreshment feature, meaning input from both technological and legal fields. Fifth, all these activities should be performed with attention to how powerful the Library may be in shaping the content of corporate contracts and the practice of corporate contracting.¹²⁹

A. Consortia or Government

The unusual mix of requirements distinguishes the KXML Library from many other processes and rules out a number of potential standard-setters. For example, the KXML Library is not simply a technology like a computer software program. While technology standard-setting commonly is led by a designated consortium, such as the WC3 for Internet standards, this seems unsatisfactory for the KXML Library because of the importance of contractual content.

Technology leaders unlikely possess interest or expertise in establishing schemas, let alone harnessing or maintaining content. For example, WC3 endorsed XML for general use but appears uninterested in providing specific extended languages such as XML for contracts.¹³⁰ The American National Standards Institute provides EDI standards but struggles to adapt these for XML commercial contracting.¹³¹ That struggle suggests that the more ambitious steps necessary to create a KXML Library are beyond its reach.

¹²⁸ Common categories range from definitions, representations, covenants, conditions, events of default, choice of law and forum clauses, and other clause classifications.

¹²⁹ Cf. Smith, *supra* note 42, [draft at 29] (emphasizing "importance of the process by which a modular system will or will not evolve"). Modularity facilitates adaptability of complex systems. When planned rather than evolved (*i.e.*, a KXML Library) those creating it "do not always have the right incentives to adopt the optimal level of modularity. People writing a contract . . . may not care enough about the wider system of legal relations . . ." *Id.*

¹³⁰ W3C Press Release, *The World Wide Web Consortium Issues XML 1.0 as a W3C Recommendation* (Feb. 10, 1998), available at <http://www.w3.org/Press/1998/XML10-REC>. W3C's membership is dominated by technology companies with a potentially parochial interest in certain outcomes. WC3 has more than 400 members, some 70% of which are for-profit computer firms; 15% are government research institutes or agencies; and 12% are industrial, communications and financial firms. Decisions are generally made by consensus among members, determined through a layered governance structure. The structure features a Chair charged with oversight and supported by an Advisory Committee and an Advisory Board plus numerous Activity Groups, including, in turn, Working Groups that develop specifications or software.

¹³¹ See *supra* note 24; SCHNEIDER, ELECTRONIC COMMERCE, *supra* note 6, at 240-41 ("Several groups, including an ASC X12 task group, have attempted to convert the ASC X12 EDI data elements and transaction set structures to XML These efforts have been stalled while . . . ebXML is refined.").

Another technology-oriented candidate is OASIS Legal XML, which formed a technical committee to state requirements for standards necessary to a range of contracting contexts.¹³² However, its work suggests three reasons to doubt the likelihood or efficacy of its providing leadership to develop a KXML Library. As to likelihood, while OASIS expresses mild hope of success in some narrow XML applications for contracting, it discounts the possibility of developing tools for what it calls complex narrative contracting.¹³³ As to efficacy, its initial report demonstrates a highly-formal and stylized understanding of traditional contracting exercises and purposes.¹³⁴ While these observations do not necessarily rule out the group's interest in contributing to a KXML Library, its opaque process does not exhibit the public orientation necessary for doing so legitimately.¹³⁵

Such a public orientation is necessary given the power XML holds for shaping contract content and redefining corporate law practice. In fact, this power is so strong that Edward Rubin proposes outlawing XML for any purpose unless adopted following specified procedures, including open public development.¹³⁶ This suggests at least the possibility that governmental leadership would be suitable.¹³⁷ Again, however, this is neither likely nor satisfactory for creating a KXML Library. It is unlikely because governments generally have deferred to non-governmental standard-setting leadership in a broad range of XML contexts, including SEC deference to XBRL.org.¹³⁸ This deference is apt in the case of a KXML Library, moreover, given that the core activity to be facilitated is private contracting. This is not a field in which government is either well suited or likely to desire to participate.¹³⁹

¹³² OASIS LEGAL XML, *supra* note 1.

¹³³ See, e.g., *id.* at 37 (“At this time it is difficult to forecast that the use of XML for contract authoring will become widespread in the near term, if ever.”).

¹³⁴ See, e.g., *id.* at 7 (“Data flow diagrams are used to identify the important processes, data flows and interfaces for each type of contract transaction;” these depict and describe contracting processes using highly stylized images resembling electrical engineering blueprints that do not resonate with corporate law practice).

¹³⁵ The technical committee intends to offer schemas for contracts. Its first public document is drafted by one person, with changes suggested from a seven-person working group. The group met once in May 2004 and corresponded by email and telephone during the ensuing year before releasing the final document. It provides few details about process.

¹³⁶ See Rubin, *supra* note 124, at _____. I am agnostic about Dean Rubin's prescription, but share his view of the stakes that inspire it. XML has proliferated and the prescription has not been implemented, but it is certainly not far-fetched as a policy option. See *infra* note 213 and accompanying text.

¹³⁷ Government sets standards in numerous contexts. See Lemley & McGowan, *supra* note 44, at 541, n. 270 (instancing standards concerning telephone network connections, broadcast communications, high definition television (HDTV) and original Internet interconnection protocols).

¹³⁸ See *supra* text accompanying note 16; GAO REPORT, *supra* note 14.

¹³⁹ One role of government is to assure requisite access, possibly through direct intervention using antitrust laws. See Lemley & McGowan, *supra* note 44, at 542; *infra* note 204.

More generally, for standards bearing network qualities, such as XML, social welfare implications from selection of ultimate standards can be significant (and there is no current urgency to obtain requisite standards quickly). In such cases, several general reasons justify discouraging governmental leadership.¹⁴⁰ First, government's career public servants and related bureaucracy are insulated from market pressures that produce requisite knowledge for optimal standard setting. For KXML, this includes abstract conceptions of contract such as the term complexity index used to shape Library content.¹⁴¹ Second, this insulation from markets risks hardening of resulting standards even if they prove sub-optimal. For example, insufficiently refined models of term complexity could endure to thwart the Library's refreshment feature. Third, government faces capture risk by users that could prevent actions in the public interest.¹⁴²

B. Commercial Proprietorship

The private sector value of the KXML Library suggests considering commercial proprietorship. West Group recently acquired a modest version of an XML-based contracting product developed by a Wall Street lawyer in the early 2000s.¹⁴³ West Group, LEXIS or another private sector legal information organization could, in theory, provide leadership in creating a KXML Library. They could command legal and technological expertise and have instant and ongoing access to vast repositories of contract content.

Preliminarily, whether commercial proprietors would exhibit requisite public orientation hinges, in part, upon one's view of the market's ability to provide suitable incentives and impose appropriate constraints. Proprietary standard setting in networks risks producing incompatible standards and an ultimate result in which a single standard setter wins and all others lose. The winner's rewards include not only the value it contributed through its development but also the value of the contributions of all losing

¹⁴⁰ See Lemley & McGowan, *supra* note 44, at 541-45; see also Mark A. Lemley, *Antitrust and the Internet Standardization Problem*, 28 CONN. L. REV. 1041, 1062-64 (1996).

¹⁴¹ See *supra* text accompanying notes 99-104.

¹⁴² See *infra* note 204. A fourth justification to discourage government from standard setting is the absence of a single relevant government for standards destined to proliferate across sovereign boundaries. Compare David R. Johnson & David G. Post, *Law and Borders: The Rise of Law in Cyberspace*, 48 STAN. L. REV. 1367 (1996) with Jack L. Goldsmith, *Against Cyberanarchy*, 65 U. CHI. L. REV. 1199 (1998) (debating whether regulation of activities occurring via the Internet is susceptible to traditional notions of territorial sovereignty).

¹⁴³ See West Group (Thomson) Press Release (May 13, 2004) (called Deal Proof, tools integrate "cutting-edge search, categorization and summarization technologies for transactional legal documents such as contracts, leases and prospectuses. These documents contain valuable clauses, entities and other information . . ."). West's Deal Proof product facilitates coordination of contractual terms with public disclosure about them. See *supra* note 78. The SEC is working on projects that appear destined to do the same. See SECURITIES AND EXCHANGE COMMISSION, ANNUAL REPORT, p. 32 (2004).

contributors.¹⁴⁴ This occurs by the winner setting prices unconstrained by competitive forces. For products with network characteristics, such as XML, this negates benefits that arise from increasingly widespread use which are achieved when prices are as low as possible.¹⁴⁵ In addition, significant waste accompanies such de facto standard setting in network contexts.¹⁴⁶

Beyond preliminary relative confidence in market processes, more specific assessment of commercial proprietorship for a KXML Library entails evaluating the costs and benefits of development to proprietors. Costs of transferring contract and clause content from existing repositories (such as Westlaw or LEXIS) into XML forms would be enormous.¹⁴⁷ Proprietary benefits are uncertain. Return on investment would accrue chiefly through intellectual property and contract rights. The following survey of potential rights suggests that these offer limited or uncertain value. Although not conclusive, the survey suggests that the relatively low value is congruent with the preliminary public policy perspective warranting skepticism about commercial proprietorship for a KXML Library.¹⁴⁸

Trademarks (and service marks) can provide some remuneration to commercial proprietors. Trademarks are distinctive symbols, mottos, words, images and other devices affixed to goods (or associated with services) for identification purposes (such as KXML LibraryTM). Federal law protects these against infringement by competitors when doing so causes consumer “confusion”¹⁴⁹ or when activity causes “dilution” to a “famous” mark.¹⁵⁰ Federal law offers limited protection to trade names and trade secrets.¹⁵¹ While such marks could produce payoffs, they are likely to be of too little value in embryonic

¹⁴⁴ See David Friedman, *Standards as Intellectual Property: An Economic Approach*, 19 U. DAYTON L. REV. 1109, 1121 (1994).

¹⁴⁵ See Lemley & McGowan, *supra* note 44, at 515-16; *see also* Lemley, *supra* note 140, at 1043-45.

¹⁴⁶ See Lemley & McGowan, *supra* note 44, at 541-42 (noting that standard setting in network contexts should aim to avoid wasteful competition that can arise from de facto standard setting).

¹⁴⁷ *Cf.* SCHNEIDER, ELECTRONIC COMMERCE, *supra* note 6, at 240-41 (doing business on the Internet poses “difficulty of integrating existing databases and transaction-processing software designed for traditional commerce into the software that enables electronic commerce.”)

¹⁴⁸ See Lemley & McGowan, *supra* note 44, at 516 n. 153 (“Nor does a proprietary standard seem necessary to encourage the production of future works of intellectual property. While this is the purpose behind providing intellectual property protection, the winners of standards competitions may receive a windfall that is far greater than what intellectual property normally gives as an incentive to invention.”)

¹⁴⁹ Lanham Act, § 32, 15 U.S.C. § 1114 (governing registered marks); *see also* Lanham Act, § 43(a), 15 U.S.C. § 1125(a) (governing unfair competition).

¹⁵⁰ 15 U.S.C. §§ 1125(c) & 1127 (1995 legislation providing protection against dilution of famous marks despite absence of confusion).

¹⁵¹ See Marina Lao, *Federalizing Trade Secrets Law in an Information Economy*, 59 OHIO ST. L.J. 1633 (1998); *see also* Economic Espionage Act of 1996, 18 U.S.C. § 1831-39.

stages to justify investment absent stronger insulation from competition that arises from patent, copyright, or contractual protection.

Patent protection would apply to features of the KXML Library treated as business methods—like tools to assemble and develop content, including a term complexity index.¹⁵² This protection is a recent innovation in intellectual property law, endorsed in *State Street Bank*¹⁵³ when the Federal Circuit stated that business methods are patentable so long as “applied in a ‘useful’ way.”¹⁵⁴ A modest parallel to a KXML Library is one company’s business model of aggregating information from many different Web sites.¹⁵⁵ Despite emerging doctrines, commercial value is not likely to be overwhelming and doubt exists concerning the scope and durability of these protections.¹⁵⁶ In any event, patent protection almost certainly would not cover contractual content or XML schemas themselves.

Copyright protection could potentially be available either for contractual content or XML schemas, which should be considered separately. As a matter of positive law, particular contracts are not routinely protected by copyright.¹⁵⁷ While standard forms sometimes enjoy protection, a KXML Library would not resemble standard forms but a collection of particular contracts—and terms. This could make content eligible for

¹⁵² E.g., West Group (Thomson), How Deal Proof Works, <http://www.thomsonelite.com> (describing Deal Proof product, *supra* note 143, and noting how it uses software with a “patented text-mining engine along with integrated artificial intelligence functions to extract and precisely tag significant content automatically”). In addition to satisfying the subject matter requirement (that is, qualifying as a business method), such tools would have to meet other requirements for patentability, including novelty and non-obviousness. See ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, PATENT LAW AND POLICY (3d ed. 2002).

¹⁵³ 149 F.3d 1368 (Fed. Cir. 1998).

¹⁵⁴ See Laura R. Ford, *Alchemy and Patentability: Technology, “Useful Arts” and the Chimerical Mind-Machine*, 42 CAL. W. L. REV. 49 (2005); see also *AT&T Corp. v. Excel Communications*, 172 F.3d 1352 (Fed. Cir. 1999) (system enabling long-distance telephone service subscriber to achieve discounts when calling reciprocal subscriber is patentable).

¹⁵⁵ SCHNEIDER, ELECTRONIC COMMERCE, *supra* note 6, at 320 (example of About.com as patented).

¹⁵⁶ See Nari Lee, *Patent Eligible Subject Matter Reconfiguration and the Emergence of Proprietary Norms: The Patent Eligibility of Business Methods*, 45 IDEA 321 (2005); SCHNEIDER, ELECTRONIC COMMERCE, *supra* note 6, at 320.

¹⁵⁷ See Mark C. Suchman, *The Contract as Social Artifact*, 37 LAW & SOC’Y REV. 91, 105 at n.21 (2003) (citing *Continental Casualty Co. v. Beardsley*, 253 F.2d 702 (2nd Cir. 1958), *cert. denied*, 358 U.S. 816 (1958); *Crume v. Pacific Mutual Life Insurance Co.* 140 F.2d 182 (7th Cir. 1944); *Donald v. Uarco Business Forms*, 478 F.2d 764 (8th Cir. 1973); *Miner v. Employers Mutual Liability Insurance Co.* 229 F.2d 35 (D.C. Cir. 1956)); see also *Dorsey v. Old Surety Life Ins. Co.*, 98 F.2d 872 (10th Cir. 1983); *Donald v. Zack Meyer’s T.V. Sales and Service*, 426 F.2d 1027 (5th Cir. 1970); *M.M. Business Forms v. Uarco, Inc.*, 472 F.2d 1137 (6th Cir. 1973).

copyright protection as a compilation. It would be akin to copyrightable collections of information assembled by proprietors such as Yahoo!¹⁵⁸

But as a matter of positive law, copyright doctrines that qualify any given level of copyright protection would be implicated to reduce any such protection, including for compilations. For example, the idea/expression dichotomy and merger doctrine would make it difficult to assert copyright ownership over most contract terms that can only be expressed in one or a few limited ways.¹⁵⁹ With similar effect, copyright's fair use doctrine could limit a KXML Library purveyor's power to prevent parties from freely using content appearing in the Library.¹⁶⁰

These preliminary legal conclusions as a matter of positive law are reinforced by taking a normative view. A virtue of modularity is how it promotes the adaptive capacity of complex systems.¹⁶¹ For a KXML Library, this means ability of participants to contribute ongoing improvement to contract content (referred to earlier as the refreshment feature). To the extent that intellectual property protections impair such ability this reduces rather than promotes Library utility. Of potent concern is copyright law's vesting of rights to create derivative works in authors of the original.¹⁶² Preventing improvements in contracts maintained in the KXML Library would significantly impair that adaptive benefit.¹⁶³

Moving from contracts and clauses to XML schemas and tagging vocabularies, more difficult copyright law questions arise. There is no positive law addressing copyright eligibility of XML. Scholars debate such basic questions as whether XML, as a language, qualifies as copyrightable subject matter.¹⁶⁴ In practice, while XML is non-

¹⁵⁸ SCHNEIDER, ELECTRONIC COMMERCE, *supra* note 6, at 318.

¹⁵⁹ *E.g.*, Copyright Act, 17 U.S.C. § 102(b); see *Feist Publications, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 350 (1991); *Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 547-48 (1985).

¹⁶⁰ *E.g.*, Copyright Act, 17 U.S.C. § 107; see *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569 (1994); *American Inst. of Architects v. Fenichel*, 41 F. Supp. 146 (S.D.N.Y. 1941).

¹⁶¹ Smith, *supra* note 42, at ____; *supra* note 129.

¹⁶² Copyright Act, 17 U.S.C. § 106(2); see Tyler T. Ochoa, *Copyright, Derivative Works and Fixation: Is Galoob a Mirage, or Does the Form(Gen) of the Alleged Derivative Work Matter?*, 20 SANTA CLARA COMPUTER & HIGH TECH. L.J. 991, 1018-20 (2004).

¹⁶³ Restricted or relinquished derivative rights are therefore necessary to promote the flexibility envisioned from the KXML Library's refreshment feature. One strategy for disabling claims to derivative-work rights that would otherwise impair the refreshment feature is to create licenses that contain conditions allowing a licensee to improve work a licensor created. This is akin to the open-source model used in computer software development.

¹⁶⁴ Compare Douglas E. Phillips, *XML Schemas and Computer Language Copyright: Filling in the Blanks in Blank Esperanto*, 9 J. INTELL. PROP. L. 63 (2001) ("although software for developing, validating, and using XML schemas ordinarily will be copyrightable, the established copyright principles reflected in the merger doctrine raise significant questions about the copyrightability of XML schemas themselves") with Trotter Hardy, *The Copyrightability of New Works of Authorship: "XML Schemas" as An Example*, 38

proprietary, some creators of XML schemas for specific applications assert copyright (ISDA, for example, asserts copyright over fpml)¹⁶⁵ but others do not (XBRL does not appear to be copyrighted).¹⁶⁶ Given differing practices and absent doctrinal guidance, normative inquiry bears even greater weight than when analyzing copyright to contracts and clauses.

Yet a normative view sustains rather than clarifies uncertainty associated with intellectual property in XML schemas. True, intellectual property theory is deeply utilitarian.¹⁶⁷ The overarching objectives and philosophical bases of US intellectual property are creating incentives to produce, rather than rewarding production.¹⁶⁸ Achieving these results entails balancing competing public policies fostering incentives to create while promoting access to resulting creations.¹⁶⁹ For a KXML Library, its network character suggests that access is central to success.¹⁷⁰ That is, having a large number of lawyers able to use the database is critical. But incentives may nevertheless be necessary to create the Library which, in turn, may require limiting access.¹⁷¹

Given limitations or uncertainties associated with intellectual property protection as such, entrepreneurs could establish contractual protections that transcend any such rights. Commercial proprietors could build a KXML Library and then charge for using it. This is how LEXIS and Westlaw operate existing information retrieval repositories. Such methods are akin to automated or digital rights management systems, which are controversial. This is because system operators need not own copyright or other

HOUS. L. REV. 855 (2001) (“although the analysis ultimately turns on factual findings that can only be made in actual litigation, it is very likely that those findings will support a conclusion that XML schemas are indeed copyrightable”).

¹⁶⁵ See www.fpml.com; *supra* text accompanying note 15.

¹⁶⁶ See www.XBRL.org; *supra* text accompanying notes 16-17.

¹⁶⁷ For example, the Constitution grants Congress power to enact copyright laws to “promote the Progress of Science and useful Arts.” Art. I, § 8, cl. 8.

¹⁶⁸ See *Sony Corp. of America v. Universal City Studios, Inc.*, 464 U.S. 417, 429 (1984).

¹⁶⁹ For illumination and critique, see Glynn S. Lunney, Jr., *Reexamining Copyright's Incentives-Access Paradigm*, 49 VAND. L. REV. 483 (1996).

¹⁷⁰ See Adam D. Moore, *Intellectual Property, Innovation, and Social Progress: The Case Against Incentive Based Arguments*, 26 HAMLINE L. REV. 601 (2003); see also *Lotus Dev. Corp. v. Borland Int'l*, 49 F.3d 807 (2nd Cir. 1995) (in case holding that Lotus 1-2-3 menu structure is uncopyrightable subject matter, Judge Boudin's concurring opinion emphasizes importance in calculus of reducing consumer switching costs).

¹⁷¹ Rewards for production are not generally recognized grounds for supporting protection. The stronger doctrinal and philosophical bases for US intellectual property protection—especially copyright—are to generate incentives to produce. Even at that level, as a doctrinal matter, contract terms and schemas would remain at the thin edge of copyright protection.

intellectual property rights in compiled materials yet still earn revenue from selling access.¹⁷²

Whether or not intellectual property or contract rights could offer sufficient return to induce proprietary investment, a public policy perspective must recognize XML's power to influence how corporate contracting is practiced and resulting terms. After all, XML bears linguistic attributes posing considerable effects on the content of corporate contracts and thus on related economic exchange.¹⁷³ From this viewpoint, a further risk facing entrepreneurs appears. Owners of a KXML Library who establish exclusive standards risk monopolizing the market in XML-assisted corporate contracting. If actions freeze development or disable access to content, antitrust authorities may be tempted to enforce some measure of openness.¹⁷⁴

In short, determining return on investment for developing and operating a proprietary KXML Library is difficult. While this is a common problem in electronic commercial technologies,¹⁷⁵ it seems particularly acute in this context. The uncertainty of applicable positive law and normative policy suggests that private entrepreneurs are—and perhaps should be—discouraged from using intellectual property valuations in deciding whether to undertake the initiative. This may explain why West Group has to date been slow to exploit commercial prospects of its nascent XML-based contracting product.¹⁷⁶ Since that was invented by a corporate lawyer, however, it is worth considering prospects for entrepreneurship among lawyers to develop a KXML Library.

C. Professional Proprietorship

The economic position of private lawyers differs from information businesses in exploiting KXML Library capabilities. They can be direct beneficiaries of this resource,

¹⁷² See Tom W. Bell, *Fair Use v. Fared Use: The Impact of Automated Rights Management on Copyright's Fair Use Doctrine*, 76 N.C. L. REV. 557 (1998); Dan L. Burk & Julie E. Cohen, *Fair Use Infrastructure for Rights Management Systems*, 15 HARV. J.L. & TECH. 41 (2001); see also Lionel S. Sobel, *DRM as an Enabler of Business Models: ISPs as Digital Retailers*, 18 BERK. TECH. L.J. 667, 673 (2003) (discussing how Westlaw and LEXIS are akin to such digital rights management systems). Although related, LEXIS and Westlaw are not digital rights management systems. The latter term denominates encryption and other controls that purveyors attach to copies of the work itself; LEXIS and Westlaw control access but not content once accessed.

¹⁷³ Cf. Burk & Cohen, *supra* note 172, at ____ (“Once constraints on behavior are built into the technical standards governing a technology, the technical standards effectively become a new method for governing use of that technology—in essence, the technical standards become a type of law.”).

¹⁷⁴ See Philip J. Weiser, *Internet Governance, Standard Setting, and Self-Regulation*, 28 N. KY. L. REV. 822 (2001) (“antitrust oversight of the setting of Internet standards will undoubtedly increase as the area becomes ripe for anticompetitive conduct”).

¹⁷⁵ SCHNEIDER, ELECTRONIC COMMERCE, *supra* note 6, at 19.

¹⁷⁶ Cf. Philip J. Weiser, *The Internet, Innovation, and Intellectual Property Policy*, 103 COLUM. L. REV. 534, 596 (2003) (“In its new .NET initiative, Microsoft has embraced the open XML standard”).

internalizing payoffs even absent intellectual property incentives. And lawyers have incentives to create optimal modularity for corporate contracts; the discussion in Section II.B of traditional form practice suggests that they act on these incentives (though modestly and despite imperfect results).

Incentives for individual law firms to pursue innovation through creating a KXML Library vary.¹⁷⁷ Law firms that are repeatedly retained for the same type of contract drafting (such as indentures or merger agreements) would benefit from internal use. Such innovation also may garner reputation value by signaling expertise. But tagging all contracts of any given type would not facilitate the ideal of modularity that XML envisions from assembling multiple contract types into component clauses.

Most law firms are not so specialized by contract type, moreover, but provide a wide range of contracting services. But creating a KXML Library is cost-prohibitive to a single firm. Developing algorithmic tools to manage Library content, such as a term complexity index, is unlikely to be affordable to individual firms, which would need increased scalability to exploit such models. Nor would such local leadership establish network benefits. Furthermore, when benefits accrue through an expanded network of users, individual firms face financial risk associated with any first-movers in innovation. This means reduced return on investment if no or few other law firms join in the effort.

As a result, to achieve modularity and network benefits, some promise of synoptic coordination appears necessary. Even consortia of law firms cannot be expected to coordinate and develop capabilities. Larger firms capable of making the investment beneficially likely are those for whom traditional form practice provides benefits through reputation and effectiveness. XML may enable them to provide higher value-added services. But they sit at the top of a hierarchy whereas a KXML Library would create a network. Existing firms atop the hierarchy—those with resources to begin a KXML Library—thus have limited incentives to do so.

This large law firm aversion may be a barrier to developing XML for corporate contracting. True, certain firms may find contracting efficiency desirable to reduce costs. But complexity benefits large firms due to the presence of more issues to evaluate and a perceived premium attached to drafting expertise that enables charging higher fees. If related knowledge is proprietary and valuable, these firms would resist moving to XML and avoid sharing such knowledge. But for many contract terms—certainly maturely-standardized terms correctly congregating in the southwestern corner of the term complexity index¹⁷⁸—the real premium arises from efficiency (achieving client objectives cheaply and swiftly) not drafting expertise designed to achieve substantively favorable or superior terms.

¹⁷⁷ Cf. Smith, *supra* note 42, [draft at 41] (single parties may not reap gains from increased investment in developing modular contract terms, although many law firms and associations of lawyers do so).

¹⁷⁸ See *supra* text accompanying notes 99-105.

So even if large law firms lack immediate incentives to promote XML, impetus for innovation could come from law firms residing in the next resource tier engaged in or aspiring to representation in transactions their larger competitors handle. These next-tier firms face competitive disadvantages when clients place premiums on favorable or superior terms and resources are commanded in elaborate contracting processes and drafting exercises to deliver them. To the extent of this premium, such firms have incentives to pool resources to develop a more standardized set of XML-based clauses. XML would neutralize the large firm advantage by reducing the apparent premium of drafting expertise and capturing associated benefits of network leveling. Contractual content available to next tier firms through the XML Library would be recognizable as at least as appealing as forms now residing in large law firms.

Large law firms could resist these next-tier initiatives, in turn, by branding efforts. These would emphasize term favorability or superiority and dismiss XML approaches as akin to off-the-rack clothing unsuitable for sophisticated business parties deserving tailored treatment. This strategy is potentially risky, however, for building a KXML Library would create significant pressure even on large firms to join rather than retreat. Next-tier firms pioneering this tool could develop considerable reputation advantages for innovation from doing so, which would be solidified after a series of successful applications in actual transactions.

Risks to large firms resisting such efforts are reinforced by considering competition among firms for inputs such as associate lawyers and other staff. XML-based contracting considerably eases the plight of associate lawyers and other staff who participate in contract drafting exercises. Relative firm usage of advanced technology is a factor in entry-level and lateral labor markets, including for lawyers and other staff. Among other benefits, using advanced technology in the workplace can facilitate employee development of portable rather than firm-specific skills.¹⁷⁹ Competition to recruit and retain the most promising lawyers and other staff would erode large firm resistance to XML usage.

Despite this analysis, law firms have shown only modest innovation in developing XML (the lawyer who developed and sold an innovative product to West was a partner of such a large firm), suggesting obstacles to full exploitation. Two additional general explanations appear. First, most lawyers are ill-equipped by training to be technology pioneers, although they might develop partnerships with businesses or technologists possessing requisite skills. Second, lawyers tend to be risk averse. Technology is risky. It is especially risky to use it in ways that may diminish traditional and familiar functions of pen-and-paper drafting and marking up, precedent searching and form or term selection.¹⁸⁰

¹⁷⁹ See Leonard Bierman & Rafael Gely, *So, You Want to be a Partner at Sidel & Austin?*, 40 HOUS. L. REV. 969, 982-986 (2003).

¹⁸⁰ See Hill, *supra* note 70.

This analysis suggests a collective action problem. Any given law firm's investment in KXML will be (a) wasted if it fails to attract a network or (b) yield positive externalities if it attracts a network, but which a law firm may be rationally unwilling to finance. Yet the gain to each firm as part of the legal profession may be high, possibly compared with traditional form practice and especially when compared to results that may arise from commercial proprietorship.¹⁸¹ And XML is a powerful tool, carrying a force at least comparable to the language of accounting and potentially more profound.¹⁸² One solution to this collective action problem is for the legal profession, as a whole, to coordinate leadership. Before developing this solution, consider briefly the possibility of incubating the KXML Library in the spontaneous world of cyberspace.

D. Open Source Approach

It is tempting to envision creating a KXML Library using the open source model associated with Internet-based information products such as Wikipedia. This is an on-line encyclopedia containing an enormous range of information about topics spanning from accounting to zoology. Entries are contributed voluntarily by millions of otherwise non-coordinated participants. Content is updated by additional contributions that expand, correct or edit previous contributions. This attribute is a functional equivalent of the refreshment feature that adds to the KXML Library's appeal.

While potentially attractive for a KXML Library, such open-source approaches face several limitations for a contracting context. As a threshold matter, distinguish again between contractual content and XML schemas (including related tagging protocols). The KXML Library's refreshment feature applies to its term content but not to schemas. Open source approaches could provide a vehicle for expanding content, but schemas cannot readily be developed that way. And schemas for XML contracting can frame and determine the range of possibilities contained in the Library.

As to content, two additional constraints appear. The first is a functional limitation as to expertise and error risk. While many non-lawyers likely could contribute meaningful content to an open-source KXML Library, ineffective or undesirable terms likely would appear with greater frequency than content managed under the direction of trained and experienced contracting lawyers.¹⁸³ For example, few non-lawyers likely possess experience and expertise necessary to appreciate relative term complexity or develop sufficiently elaborate models of a term complexity index to channel optimal content into the KXML Library. The second constraint is related and may be dubbed

¹⁸¹ Next-tier law firms could coordinate with commercial proprietors to promote expertise and innovativeness in forging XML tools for corporate contracting. The combined power would threaten larger firms and accelerate the innovation process.

¹⁸² See *supra* text accompanying note 124 (image of Orwellian *Newspeak*).

¹⁸³ Wikipedia is prone to error and fabrication. See Katharine Q. Seelye, *A Little Sleuthing Unmasks Writer of Wikipedia Prank*, N.Y. TIMES, Dec. 11, 2005.

regulatory: the activity of contract term composition would be treated as the unauthorized practice of law in many jurisdictions.¹⁸⁴

Some features of an open source approach remain potentially appealing. First, a protocol could be designed for partial open source that would restrict participant access to registered lawyers (and this class, in turn, could be restricted to those having corporate contracting experience). Second, a mechanism could be designed to enable any participant to rank clauses, including by disclosing their normative identity. For example, a composite ranking could be computed that indexes clauses most appealing to buyers versus sellers or borrowers versus lenders.¹⁸⁵ Both features may likewise be built into a KXML Library developed by the legal profession using a more targeted model of standard setting that might be called a public/private model.

E. Public/Private Model

Among emerging solutions to standard setting generally, and especially for standards with network externalities, are non-governmental organizations.¹⁸⁶ Essential to effectiveness is allowing open participation and broad processes that engage the full range of required expertise, giving these entities a hybrid public/private quality.

These organizations can be more efficient than governmental standard setters and less prone to capture. They are exposed to market influences and exhibit market orientations, spurring search for optimal standards. Another benefit is how they overcome social welfare losses associated with commercial proprietorship. With multiple constituents, there is an internal competition among the group that extends the competitive arena from the single period of proprietary standard setting to an ongoing series of competitive rounds.¹⁸⁷ This promotes uniform standards while eliminating waste that arises from multiple competitors fighting for leadership and addresses the anti-competitive product pricing imposed by winners of such competitions.¹⁸⁸ Finally, for a KXML Library, this approach solves the collective action problem facing professional proprietorship and overcomes the expertise limitations of open-source approaches.

¹⁸⁴ See, e.g., *Pioneer Title Ins. & Trust Co. v. State Bar*, 326 P.2d 408 (Nev. 1958); *State Bar v. Guardian Abstract & Title Co.*, 575 P.2d 943 (N.M. 1978); see also Joyce Palomar, *The War Between Attorneys and Lay Conveyancers: Empirical Evidence Says "Cease Fire"*, 31 CONN. L. REV. 423, 454-55 (1999); Baier, *The Developing Principles in the law of Unauthorized Practice [of] Real Estate Brokers*, 9 ST. LOUIS U.L.J. 127 (1964); Meredith Ann Munro, *Deregulation of the Practice of Law: Panacea or Placebo?*, 42 HASTINGS L.J. 203 (1990).

¹⁸⁵ See *supra* note 114 and accompanying (endurance of buyer or seller clauses within KXML Library).

¹⁸⁶ See Douglas D. Leeds, *Raising the Standard: Antitrust Scrutiny of Standard-Setting Consortia in High Technology Industries*, 7 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 641, 643-649 (1997).

¹⁸⁷ Lemley & McGowan, *supra* note 44, at 517, n. 160 (citing Katz & Shaprio, *supra* note 43).

¹⁸⁸ Lemley & McGowan, *supra* note 44, at 516-17; see also Lemley, *supra* note 140, at 1043-45.

Pursuing this solution, the legal profession may be uniquely suited to establish a KXML Library and provide associated infrastructure. At law firms of various sizes and through professional associations, the legal profession has contracting experience and knowledge of legal and market developments, could enlist technological expertise and boast a public orientation. Given XML's potential utility, and risks, the profession should command necessary resources even absent intellectual property incentives. Contributors should include law firms aware of collective action problems, professional associations capable of contributing coordination functions, enterprises aware of efficiency gains¹⁸⁹ and research universities with affiliated law schools willing to invest in technological research and support.

As examples, the American Bar Association (ABA) has experience in establishing analogous standards, albeit on both smaller and less technical scales. On a smaller scale, in the late 1980s, it used a Task Force to contribute contract standards for EDI,¹⁹⁰ less technically, the ABA routinely participates in preparing standard printed forms of agreement for use in corporate contracting.¹⁹¹ The American Bar Foundation (ABF) has invested considerably in developing and studying technology to promote more effective contracting.¹⁹² Likewise routinely involved in public-oriented activities are private associations such as the Association of the Bar of the City of New York (ABCNY) and subject-matter alliances such as the Bond Lawyer's Association. University interest in analogous undertakings includes University of Missouri's CORI project¹⁹³ and, at the level of legal academics, the American Law Institute (ALI).

Orchestrating these varied groups into a functional body requires a structure. An appealing model is that followed by accounting standard setters, the Financial Accounting Standards Board (FASB). It was created in 1973 after a broadly-based study group—with representatives of the profession, industry and academia—evaluated the optimal method of articulating accounting standards. The group's recommendations were widely endorsed by industry, financial analysts, accounting educators, practicing accountants and, ultimately, the Securities and Exchange Commission (SEC).¹⁹⁴ The SEC determined that FASB would provide an appropriate institutional framework to produce responsible standards based on research and consideration of varying viewpoints.¹⁹⁵

¹⁸⁹ A wide variety of clients should likewise be involved. These include borrowers and lenders, buyers and sellers, employees and employers and numerous others. Participation from not-for-profit organizations also is critical, especially from public authorities routinely involved in complex contracting, such as the Port Authority of New York and New Jersey and the Massachusetts Port Authority.

¹⁹⁰ See ABA Task Force on EDI, *supra* note 26.

¹⁹¹ *E.g.*, *supra* note 80 (example of model indenture).

¹⁹² See *supra* text accompanying notes 121-122.

¹⁹³ See *supra* note 72.

¹⁹⁴ See SECURITIES AND EXCHANGE COMMISSION, ACCOUNTING SERIES RELEASE NO. 50 (1973).

¹⁹⁵ *Id.*

The SEC's assessment acknowledged the substantial collective experience and expertise of FASB's diverse members and supporting professional organizations, along with the commitment of resources that reflected a public orientation within the otherwise private body.¹⁹⁶ Since its formation, FASB has been a private-sector body with accounting expertise, knowledge of developments and a public orientation. It follows a public process that involves a wide variety of constituencies.¹⁹⁷ Its promulgations are incorporated by reference into private contracts and embodied in federal securities regulation.

While this model could be appealing for many XML standard-setting applications, three specific additional reasons make FASB's model appealing for an XML contract standing setting body led by the legal profession. First, FASB's process—and results—have not produced the controversy associated with other models such as consortia standard-setting.¹⁹⁸ The consortia that prepare XML-based technology bear a like public burden but the consortium consensus model used by WC3 and OASIS Legal XML pales in comparison to that of FASB.¹⁹⁹ Second, FASB already is a functional corporate-contracting standard setter: GAAP is incorporated by reference into corporate contracts.²⁰⁰ FASB thus provides a coordination function that helps lawyers reduce over-

¹⁹⁶ *Id.* FASB, in turn, is overseen by the Financial Accounting Foundation (FAF), led by independent trustees and responsible for overseeing, funding, and appointing FASB members and selecting members of an advisory body. The SEC likewise endorses FAF in these roles. *See* SECURITIES AND EXCHANGE COMMISSION, STATEMENT OF POLICY (April 25, 2003).

¹⁹⁷ These include the Accounting Standards Executive Committee (AcSEC) and Auditing Standards Board of the AICPA, the International Accounting Standards Board (IASB), and relevant committees of such organizations as the Association for Investment Management and Research (AIMR), Financial Executives International (FEI) and Institute of Management Accountants (IMA). *See* FASB, How Topics are added to the FASB's Technical Agenda, www.fasb.org (as of July 2004).

¹⁹⁸ *See* William W. Bratton, Jr., *Private Standards, Public Governance: A New Look at the Financial Accounting Standards Board*, 46 B.C. L. REV. ____ (forthcoming 2006). FASB has not been immune to criticism, but in general it has fared well. *See* SECURITIES AND EXCHANGE COMMISSION, COMMISSION STATEMENT OF POLICY REAFFIRMING THE STATUS OF THE FASB AS A DESIGNATED PRIVATE-SECTOR STANDARD SETTER, Rel. Nos. 33-8221, 34-47743; IC-26028; FR-70 (April 25, 2003) [hereinafter SEC, STATUS OF FASB]; Bratton, *Rules Versus Principles Versus Rents*, *supra* note 77; Frederick Gill, *Principles-Based Accounting Principles*, 28 N. C. J. INT'L L. & COMM. REG. 967 (2003); Matthew A. Melone, *United States Accounting Standards: Rules or Principles? The Devil Is Not in the Details*, 58 U. MIAMI L. REV. 1161 (2004). An alternative to FASB's model is followed by the Public Company Accounting Standards Board (PCAOB), created by Sarbanes-Oxley to establish auditing standards. Sarbanes-Oxley Act of 2002, Pub. L. No. 107-204, § 101(b). While appealing, PCAOB's process does not differ markedly from FASB's except that its standards require SEC approval and it faces additional criticism concerning legitimacy because of its status as a statutory creature purporting to operate as a private-sector body. *See* Donna M. Nagy, *Playing Peekaboo with Constitutional Law: The Public Company Accounting Oversight Board and Its Public/Private Status*, 80 NOTRE DAME L. REV. 975 (2005).

¹⁹⁹ *See* Michael A. Froomkin, *Wrong Turn in Cyberspace: Using ICANN to Route Around the APA and the Constitution*, 50 DUKE L.J. 17 (2000).

²⁰⁰ *See supra* text accompanying notes 53-69.

simplification and excess complexity.²⁰¹ Third, FASB's constituents overlap with constituents affected by XML-based contracting schemas. GAAP affects all organizations that prepare financial statements; virtually all organizations engaged in corporate contracting prepare financial statements.

Adapting FASB's model to KXML, representatives of partnering organizations would constitute an oversight body to form a board (the "KXML Board") to establish a KXML Library, including agreeing on tagging vocabularies and determining contract content.²⁰² The KXML Board would be a not-for-profit organization, with members appointed by the oversight body based upon demonstrated public-oriented leadership. Advantages of this structure in standard-setting include mandate to contribute knowledge as a public service, name recognition (*e.g.*, ALI-ABA) that would stimulate demand for Library usage with associated network benefits, capacity to recruit volunteers to minimize costs and preferential tax treatment.²⁰³

No concern should arise that the KXML Board would slow the pace of innovation in contract terms. This risk would be real if its endorsement or approval were a prerequisite to usage. But participants should not view the KXML Board as a regulatory authority whose authorization or endorsement is required for using contract terms. The KXML Board should make its role more modest, as dynamic archivist whose ongoing interest is maintaining the KXML Library's refreshment feature. This structure would thus avoid capture risk usually associated with other bodies or the government because the KXML Board would not function as a regulator but as a coordinator. It likewise would thus avoid cabal risk associated with oligarchies because of the many different viewpoints represented on the oversight body.²⁰⁴

Standard-setting for XML schemas would follow an extensive public-oriented program. The KXML Board would address alternative tagging protocols and classification of contract and clause modules. It would evaluate how proposed standards

²⁰¹ See Kahan & Klausner, *supra* note 48, at ____.

²⁰² The structure would be used both to establish an umbrella organization to develop XML for contracting generally, along with subsidiary organizations assigned to special projects.

²⁰³ See Davis, *supra* note 120.

²⁰⁴ A principle reason to discourage governmental standard setting in general, and for XML, is capture risk. See *supra* text accompanying note 142. If influential enterprises lobby for differentially beneficial standards, the non-influential participants lose out. A similar problem can arise from non-governmental standard setting. In fact, with non-governmental standard setting, influential participants may obtain these rents more readily. To this extent, a role for government returns. It would not consist of establishing standards but of policing efforts of those who do. One mechanism to assure this breadth is antitrust enforcement. Cartel like participants risk violating Section 1 of the Sherman Act which prohibits horizontal agreements among competitors. See Lemley & McGowan, *supra* note 44, at 515-16. A closed or narrow organization or process could enable insiders to exclude outsiders with anti-competitive effects. This could violate antitrust laws that forbid horizontal group boycotts and concerted refusals to deal with competitors. *Id.*

promote accessibility and adaptability and bear other desired features.²⁰⁵ Many different parties would be able to request that it address various subjects or it may initiate action on its own. It would consult numerous other organizations and groups for advice and information and sometimes use task forces to do so. The KXML Board would prepare a series of written products during its process, starting with a Discussion Memorandum before a project begins, including a proposed Exposure Draft for public comment, and concluding with a Final Standard upon Board approval.

As for contractual content, the KXML Board should follow a similar process in selecting contract types and modules for inclusion in the KXML Library. After initial population of the Library, it could design and agree upon an approach for continuous updating to activate the Library's refreshment feature. This could adapt the approach now used in financial reporting. Companies file XBRL-tagged financial statements with the SEC using its EDGAR system; searches are performed routinely on those documents to extract related data into organized databases. The KXML Board could direct that XML-tagged contracts filed with the SEC be parsed for rendition into the KXML Library on a routine, automated basis. CORI does this presently using word processing (Word) files.²⁰⁶ Content determinations would be made using devices such as the term complexity index, to assure optimal populations of terms classified as complex, simple or mildly complex.

Funding would be provided by resources otherwise available to like organizations, including grants and donations from private sources such as foundations, law firms and businesses. In this respect, the model follows that FASB used from its inception until 2002, when Congress opted to provide all FASB's funds by imposing fees on public companies.²⁰⁷ While this latter approach may be appealing, Congress is unlikely to provide similar support for a KXML Library and such support may not be necessary to maintain the KXML Board's independence from parochial interests.²⁰⁸

The funding issue reveals a criticism of FASB's model to be avoided. FASB claims copyright in its standards yet they are embodied in federal securities regulation, becoming essentially public law.²⁰⁹ This justifies criticizing FASB for partial

²⁰⁵ See *supra* note 110 and accompanying text (features necessary to facilitate using a KXML Library, including ability to change, add, subtract and rearrange terms while maintaining contract coherence).

²⁰⁶ See *supra* note 72.

²⁰⁷ Sarbanes-Oxley Act of 2002, Pub. L. No. 107-204, § 109.

²⁰⁸ Before Sarbanes-Oxley, the accounting profession's leading trade group, the American Institute of Certified Public Accountants (AICPA), and largest accounting firms contributed a significant portion of FASB's funding. Many considered the profession's funding to impair FASB's independence. Sarbanes-Oxley responded to this perception. See Lawrence A. Cunningham, *The Sarbanes-Oxley Yawn: Heavy Rhetoric, Light Reform (And It Just Might Work)*, 35 CONN. L. REV. 915 (2003).

²⁰⁹ See Lawrence A. Cunningham, *Private Standards in Public Law: Copyright, Lawmaking and the Case of Accounting*, 104 MICH. L. REV. 291 (2005). This governmental leveraging strategy is an increasingly common phenomenon. *Id.*

masquerade, an avowedly public body disguising features of private enterprise.²¹⁰ For XML contracting, the discussion of commercial proprietorship (in Section B above) casts doubt upon whether copyright protections apply (and uncertainty as to the value or scope of trademark and patent rights). For the KXML Board, this doubt should be resolved by treating its products as automatically belonging to the public domain. The KXML Board would thus relinquish intellectual property claims, authentically contributing public standards for private law.²¹¹

This prescription raises a final feature of FASB's role relevant to XML standards for corporate contracting established by the legal profession. In the Sarbanes-Oxley Act of 2002, Congress declared that federal securities law would not recognize any accounting standards unless adopted following a process possessing certain characteristics, including open public development—which FASB follows.²¹² This is a light analogue to Edward Rubin's prescription to outlaw XML unless so adopted, suggesting that it is not far-fetched.²¹³

After all, XML's efficacy requires a single standard setting organization to avoid Tower of Babel problems, also true of accounting.²¹⁴ If a single body is necessary, the public-private model described likely would be more nearly optimal than other alternatives such as government, technology consortia, commercial proprietorship, professional proprietorship or open-source approaches. While this prescription for developing public standards for private law of contracts seems compelling, it also should appeal in many contexts in which a single standard-setter is essential but where participants face collective action or other limitations on coordinated movement.

IV. SECOND ORDER EFFECTS

Development of XML-based corporate contracting presents profound second order effects. Some mirror broader sociological consequences of technological development while others are peculiar to the corporate contracting exercise. Among general effects are the relationships between law and technology and law and business

²¹⁰ *Id.*, at 292.

²¹¹ This would differ from the ABA's traditional practice of asserting copyright over its publications. See Michael Ariens, *The Ethics of Copyrighting Ethics Rules*, 36 U. TOL. L. REV. 235 (2005).

²¹² Sarbanes-Oxley Act of 2002, Pub. L. No. 107-204, § ____.

²¹³ See *supra* note 136 and accompanying text. Dean Rubin made his prescription in 2000, before much progress in XML applications occurred; since then, the tool has proliferated without following the prescription. See *supra* notes 14-27 and accompanying text.

²¹⁴ See *supra* text accompanying note 41. Despite need for a single set of accounting standards, historically, numerous sources of accounting standards are recognized in the so-called GAAP hierarchy. See AICPA, STATEMENT ON AUDITING STANDARDS NO. 69. However, the SEC at present only recognizes FASB as an official standard setter. See SEC, STATUS OF FASB, *supra* note 198; Cunningham, *supra* note 209, at 325, n. 177.

where, in each case, power shifts occur from lawyers to technology or business persons. Among specific effects, KXML would influence a fundamental debate concerning the conception, within law and economics, of the modern corporation as a nexus of contracts.

A. Law and Technology

Lawyers traditionally are leading participants in designing and documenting corporate transactions. XML-based corporate contracting would bring computer programmers and facilitators into this sphere. They certainly would participate actively in standard-setting and in building a KXML Library. They might even have roles to play in the actual contracting process.²¹⁵ That spells a potentially radical shift in power from corporate lawyers to technologists. Numerous implications appear from this and kindred infiltrations of technology into law practice.

First, this entails a cultural shift in law practice. Software programming and legal cultures differ dramatically. The former is deeply efficiency-oriented, depicts process using clear flow charts, decision trees, assigned functions, and crisply defined forms.²¹⁶ Lawyering generally is not efficient; it is a friction-filled, fluid and often frustrating process that consciously recognizes other important virtues including promoting participant satisfaction with results.²¹⁷ Even among transaction cost engineers, efficiency is important but mediated by other process-oriented values. The existing balance between efficiency and mediation in corporate lawyering would potentially shift when technologists assume greater roles.

Second, the process of lawyer training must adapt. Proponents of lawyers as transaction cost engineers prescribed teaching deal-design and contracting skills to law students in the business law curriculum of law schools.²¹⁸ While this prescription remains in pedagogical infancy, XML raises the stakes. Lawyers must develop those skills and also acquire library-and-menu composition skills.²¹⁹ When clients rely upon these tools, moreover, as they increasingly do with XBRL, law students should be exposed to them. Within law schools, therefore, numerous curricular considerations arise. These include

²¹⁵ E.g., Ernest M. Thiessen, P. Eng, & Joseph P. McMahon, Jr., *Beyond Win-Win in Cyberspace*, 15 OHIO ST. J. ON DISP. RESOL. 643 (2000). A related Web site presents product simulations. <http://www.smartsettle.com>.

²¹⁶ See *supra* note 134 and accompanying text.

²¹⁷ See Vincent, *supra* note 5, at 1427 (noting the “contrast between the thought processes of lawyers and technologists. Lawyers view the world in shades of gray. Technologists view the world as a binary decision tree, albeit sometimes very complex.”).

²¹⁸ Gilson, *supra* note 47.

²¹⁹ See MARC LAURITSEN *ET AL.*, SUBSTANTIVE TECHNOLOGY IN THE LAW SCHOOL OF THE 1990S: AN INTERNATIONAL CONFERENCE (monograph produced from a conference held in Salzburg, Austria and sponsored by University of Salzburg School of Law, Harvard University Law School and Brigham Young University School of Law).

improvements to the first-year Contracts course; primary courses in the business law curriculum such as Corporations, Securities Regulation, Corporate Finance, Mergers & Acquisitions, and Law & Accounting; and contract drafting and legal writing courses.²²⁰

Legal educators increasingly recognize how traditional modes of teaching Contracts using cases should be supplemented by studying transactional documents.²²¹ The advent of innovative contracting tools requiring specialized training will add pressure to deliver this form of pedagogy. This need not morph into contract drafting courses, which would need changing in obvious technical ways. Rather, rich conceptualization of contract documents is possible that is seldom pursued in the first-year course. Contemplating the range of tailoring versus standardization and probing for the conditions in which one end of the range or the other is optimal could be fruitful. Just as the term complexity index sketched in Section II.C can sharpen an approach to promote utility of a KXML Library and serve other functions, such models can be developed for classroom critique. This could occur in the Contracts classroom as well in upper level business law courses.

Third, a rising role of technology in law practice raises deeper questions concerning the scope of lawyers' professional responsibility to understand it. In connection with due diligence exercises in securities offerings or merger transactions, for example, some level of knowledge likely is necessary. This may encompass existing XBRL accounting and emerging XML contracting. Requisite knowledge would resemble existing requirements concerning mastery of basic principles of accounting. The exact scope of a lawyer's responsibility as to accounting is contested.²²² Its exact scope concerning XML—both as a nascent drafting tool and for client accounting reports in XBRL—likely will become subject to similar debate.

B. Law and Business

XML-based contracting poses further power shifts away from outside law firms and towards in-house counsel. Since the mid-1980s, corporate law departments have replicated the skills once possessed uniquely by their outside law firms and done so at lower cost. Accompanying that shift was increased prominence of in-house counsel at

²²⁰ See Judith Tracy, *Teaching Fundamental Structure in Legal Writing through the Use of Samples*, 21 *TOURO L. REV.* 297 (2005).

²²¹ See Edward Rubin, *Why Law Schools Do Not Teach Contracts and What Socioeconomics Can Do About It*, 41 *SAN DIEGO L. REV.* 55 (2004).

²²² Compare Lawrence A. Cunningham, *Sharing Accounting's Burden: Business Lawyers in Enron's Dark Shadows*, 57 *BUS. LAW.* 1421 (2002); Deborah L. Rhode & Paul D. Paton, *Lawyers, Ethics and Enron*, 8 *STAN. J. L. BUS. & FIN.* 9 (2002); William H. Simon, *Wrongs of Ignorance and Ambiguity: Lawyer Responsibility for Collective Misconduct*, 22 *YALE J. ON REG.* 1 (2005); William O. Fisher, *Where Were the Counselors? Reflections on Advice Not Given and the Role of Attorneys in the Accounting Crisis*, 39 *GONZAGA L. REV.* 29 (2003); Steven L. Schwarcz, *The Limits of Lawyering: Legal Opinions in Structured Finance*, 84 *TEX. L. REV.* 1, 20-21 at n. 105 (2005).

most medium or larger corporations.²²³ These developments were caused by corporate business leadership's desire to manage escalating costs of outside legal counsel. They redefined the relationship by treating outside lawyers as offering products to be evaluated and purchased like other production inputs rather than adhering to old-fashioned conceptions of lawyers as providers of uniquely valuable professional services.²²⁴

Since the 1990s, outside law firms are retained for specific complex transactions while in-house lawyers assume an expanded range of functions.²²⁵ Although outside law firms play leading roles in innovative financings and complex mergers, in-house counsel play increasingly significant roles in completing employment agreements, real estate transactions, leases, some forms of loans and some relatively homogenous and recurring transactions such as a series of deals in a business acquisition program. KXML can accelerate this shift, moving even more transactions from outside firms to in-house counsel.

A KXML Library may induce business people to believe that they are at least as capable as lawyers—in-house or outside—to compose first drafts of contracts.²²⁶ Businesspersons often believe that now, of course, often forming transactions without attending to many issues lawyers would address.²²⁷ Sometimes they do so without consulting their lawyers or with lawyerly deference based on a hunch that error risk is low. A KXML Library could improve businessperson effectiveness in taking such drafting control. Benefits are thus reduced costs and efficiency gains but at the expense of values that lawyers contribute to corporate contracting such as risk-aversion and process-orientation. Likewise, benefits are increased client autonomy but at the expense of the counseling value manifest in the traditional nature of the attorney-client relationship.

A power shift from law to business amplifies the power shift from law to technology. As noted, the latter shift suggests increased need for lawyers to have knowledge of technology used in generating contracts (and accounting information included in financial reports). Yet, as this technology expands the scope of required professional skills and knowledge, the power shift from law to business moves that

²²³ Frederick W. Lambert, *Preliminary Inquiry into the Transcendence of Value Creation*, 74 OR. L. REV. 121 (1995).

²²⁴ *Id.* (quoting Robert E. Rosen, *The Inside Counsel Movement, Professional Judgment and Organizational Representation*, 64 IND. L.J. 479, 505-06 (1989)).

²²⁵ This taxonomy is from Professor Lambert, *supra* note 222, at ____.

²²⁶ A similar but more modest shift occurred during recent decades for individual contracting in such contexts as family law, estate planning, taxation, personal bankruptcy and certain criminal defense matters. Cruder but parallel pressures generated scores of simplified form books that are widely available in book stores designed to facilitate “do-it-yourself” consumer contracting. *See supra* note 72 (Internet-based purveyors of legal forms).

²²⁷ *Cf. supra* note 26 and accompanying text (context of early EDI transactions).

knowledge inside corporations and into their business and technology personnel. A *Catch-22* appears: XML means both that lawyers need more technology knowledge and that access to such knowledge is more limited.

Resolving this conundrum could be aided by refining tools such as the term complexity index. Division of labor between in-house and outside counsel, and between lawyers and businesspersons, could be gauged according to relative degrees of complexity associated with transactions. The term complexity index can be used to classify terms as complex, simple or mildly complex, with actual contracts classified in accordance with the relative presence of each type. Assignments of professional roles could be based on resulting complexity measurements in more rigorous ways than the intuitive assessments often made to allocate assignments currently.²²⁸

Switching the business perspective from lawyers and clients to that of the legal profession, KXML would shift power from larger to smaller law firms. As a network, the KXML Library would expand access to superior contracting content to smaller firms and reduce comparative advantage in this function that large law firms enjoy. The Library neutralizes hierarchal arrangements that traditionally characterize the legal profession. The forms at Smith Law Firm will be every bit as good as those at Cravath, Swaine & Moore.²²⁹ True, judgment and experience remain valuable traits in developing and negotiating complex corporate transactions and providing requisite contracts. But widespread access and currency would shift power a great deal from money-center law firms to those in the hustings.

A global leveling effect would also occur, with somewhat different consequences. Establishment and proliferation of a U.S.-based KXML Library would deepen the cultural hegemony of contracting in global exchanges using the English language and U.K. and U.S. law firms. This would proportionally diminish the influence of other legal traditions and cultures, which often vary markedly. A striking contrast is how German language contracts prepared by Germanic lawyers follow norms manifest in shorter contracts and compact contractual expression.²³⁰ Relative merits of this effect are

²²⁸ Such tools likewise could be used in research to predict the extent to which KXML would produce increased outsourcing or in-house migration for contracts bearing varying populations of the three sorts of terms.

²²⁹ An apocryphal story by noted deal lawyer James Freund suggests aspirations. A novice Kansas lawyer is retained by the buyer in one deal and the seller in another. The buy-side client's seller is represented by a top Los Angeles law firm and the sell-side client's buyer by a top New York firm. Having never done such a deal, the Kansan awaits the draft from the L.A. firm, marks it up perfunctorily for name and like changes, and sends the result to the New York firm; when he receives the New York firm's mark-up of the proposal, he likewise adjusts it perfunctorily and forwards a version as his mark-up to the Los Angeles firm. JAMES FREUND, *ANATOMY OF A MERGER* (1976).

²³⁰ See Hill & King, *supra* note 75.

uncertain, but entail a certain shift towards lengthier contracts in those cultures (although this relative length should be offset by reduction of excess complexity).²³¹

C. Law and Economics

The possibility of KXML presents implications for corporate law discourse inquiring into the role of contracts in firm constitution and governance. Economic theory attributes the existence of corporations (and other business organizations, which economists collectively call firms) to transaction cost reduction by harnessing activities under an authoritative structure.²³² Deciding to pursue activities within a firm or use external markets hinges, in part, on the efficacy of contracts to manage transaction costs.²³³ KXML can play an important role in decisions that this theory of the firm and transaction cost viewpoint pose.

Once firms exist, economic theory explains internal governance structure according to devices that enable internal monitoring of production efforts of teams within them.²³⁴ For public corporations and some private ones, managerial control is separated from equity ownership.²³⁵ Senior managers and common shareholders conceptually occupy the legal positions of agents and principals, respectively. Combining the team production model and principal-agent conception, the corporation can be reconceived as a nexus of contracts. In it, participants exchange authority in wealth-maximizing ways using a variety of express and implicit contracts and supported by markets.²³⁶

These theories are cumulative but also discrete, leading to a discourse that sometimes exhibits conflation or confusion.²³⁷ The theory of the firm is compatible with

²³¹ Within the U.K./U.S. framework, a different competition could emerge, such as over the extent to which regulatory authorities intervene in refusing to enforce certain contractual expressions. For example, the U.K. Panel on Takeovers may reject enforcement of conditions such as material adverse change clauses in merger agreements. See *supra* text accompanying notes 86-88. U.S. courts tend to struggle to identify and apply such clauses according to precise linguistic cues and recognized interpretive techniques. See *In re IBP S'holders Litig.*, 789 A.2d 14, 21 (Del. Ch. 2001), *motion for vacatur denied*, 793 A.2d 396 (Del. Ch. 2002) (cited *supra* note 84).

²³² Ronald Coase, *The Nature of the Firm*, 4 *ECONOMICA* 386 (1937).

²³³ OLIVER E. WILLIAMSON, *MARKETS AND HIERARCHIES: ANALYSIS AND ANTITRUST IMPLICATIONS* (1975).

²³⁴ Armen A. Alchian & Harold Demsetz, *Production, Information Costs, and Economic Organization*, 62 *Am. Econ. Rev.* 777 (1972); see also Margaret M. Blair & Lynn E. Stout, *Team Production in Business Organizations: An Introduction*, 24 *J. CORP. L.* 743 (1999).

²³⁵ ADLOF A. BERLE & GARDINER C. MEANS, *THE MODERN CORPORATION AND PRIVATE PROPERTY* (1932).

²³⁶ Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 *J. FIN. ECON.* 305 (1976).

²³⁷ See Michael J. Meurer, *Law, Economics and the Theory of the Firm*, 52 *BUFFALO L. REV.* 727, 731-32 (2004); see also William A. Klein, *The Criteria for Good Laws of Business Association*, 2 *BERK. BUS. L. J.* ____ (2005) (urging corporate law scholars to state premises clearly before conducting analysis).

transaction cost economics and each of these, in turn, is compatible with principal-agent accounts and nexus-of-contracts stories of the corporation. On the other hand, emphasizing one or another of the components leads to varying legal prescriptions for corporate law and corporate governance. As examples, scholars debate the optimal allocation of decision-making power within the firm, vesting more or less power in boards of directors or shareholders under alternative interpretations of these components;²³⁸ the place of other constituencies also changes.²³⁹

An important aspect of such debates concerns the relative role of the state and corporate law versus markets and contracts to manage transaction costs. People disagree as to the magnitude of those costs and about how reliable markets and contracts are in reducing them.²⁴⁰ The optimistic view is the nexus-of-contracts account;²⁴¹ the pessimistic view is the contract failure model, in which contract failure arises from “inherent limits on the skills of contracting parties.”²⁴² Both views resonate as potentially correct, and there is no question that the corporation has significant contractual aspects.²⁴³

In general, KXML speaks to the portion of this debate concerning the efficacy of explicit contracts to reduce transaction costs. If the nexus of contracts model of the modern corporation is an accurate description, one should expect to see KXML proliferate because it facilitates internalization of the benefits of superior transaction cost

²³⁸ E.g., Stephen Bainbridge, *Director Primacy: The Means and Ends of Corporate Governance*, 97 NW. L. REV. 547 (2003); Lucian Arye Bebchuk, *The Case Against Board Veto in Corporate Takeovers*, 69 U. CHI. L. REV. 973 (2002); Robert B. Thompson & D. Gordon Smith, *Toward a New Theory of the Shareholder Role: “Sacred Space” in Corporate Takeovers*, 80 TEX. L. REV. 261 (2001).

²³⁹ E.g., Lawrence E. Mitchell, *The Fairness Rights of Bondholders*, 65 N.Y.U. L. REV. 1165 (1990); Kent Greenfield, *The Place of Workers in Corporate Law*, 39 B.C. L. REV. 283 (1998).

²⁴⁰ As Professor Bratton explains, these politics manifested in the late 1980s discourse dubbed the mandatory-enabling debate in corporate law. The issue was the mix of required or optional provisions in state corporation law. The right, biased for options, conceptualized states as providers of corporation law in a market that authorized corporations to choose their law and tailor it; the left, biased for mandates, countered that states are institutions of social control that prescribe corporation law. The center held, with debate resolving essentially that certain terms are mandatory while others are changeable, and the vehicle of change—the charter amendment—subject to similar variability depending on the subject of a proposal. See William W. Bratton, Jr., *The Economic Structure of the Post-Contractual Corporation*, 87 NW. L. REV. 180 (1992).

²⁴¹ See FRANK H. EASTERBROOK & DANIEL R. FISCHEL, *THE ECONOMIC STRUCTURE OF CORPORATE LAW* 1-39 (1991).

²⁴² See OLIVER E. WILLIAMSON, *THE ECONOMIC INSTITUTIONS OF CAPITALISM: FIRMS, MARKETS, RELATIONAL CONTRACTING* 45-61, 294-97, 301-02 (1985); Oliver E. Williamson, *The Modern Corporation: Origins, Evolution, Attributes*, 19 J. ECON. LIT. 1537, 1544-46 (1981). According to Williamson’s more hotly contested proposition, contract failure also can arise from raw pursuit of rational self-interest yielding suboptimal opportunism.

²⁴³ Bratton, *supra* note 240, at ____.

engineering.²⁴⁴ KXML can contribute to reducing the incidence of contract failure by enhancing the skills of contracting parties and their agents. In turn, if KXML proliferates, the nexus of contracts account gains appeal by increasingly realizing those benefits.

More specifically, robustness of the nexus of contracts account hinges on a central implicit assumption that participants are rational economic actors. Contracts are referenced as leading vehicles through which economic rationality is expressed and achieved. The theory of transaction cost engineering builds on the nexus of contracts model and prescribes a practice designed to reduce transaction costs. Traditional form practice shows limits on carrying out this prescription, making the theory of contract failure more realistic than the nexus of contracts account. XML's prospects show the possibility of promoting more effective transaction cost engineering, which would strengthen the efficacy of the nexus of contracts account.

Consider a futuristic example, which also builds on points made in preceding Sections. A basic problem in transactional negotiations is establishing how joint and distributed gains can be maximized through a mix of disclosure and (honest) exaggeration.²⁴⁵ This balance often eludes negotiators, meaning deals are struck on sub-optimal terms—one or both sides “leaving money on the table.” While human-mediation is offered as a solution, this practice is not widely followed.²⁴⁶ Computer-assisted bargaining using XML can neutralize these effects by producing complete but invisible disclosure: disclosure to computers that parties use in negotiations but that is never seen by the other side.²⁴⁷ In addition to both provoking disclosure and keeping it confidential, the beauty of the negotiating model is that computers can more easily handle multiple parameters than humans can—and more swiftly.

Fiendish issues of contract law concerning assent appear when enlisting computers to conduct bargains. The concept of an electronic agent, minted to fit

²⁴⁴ Cf. Smith, *supra* note 42, [draft at 16] (“If a business organization is a nexus of contracts, then the contracts chosen will be highly modular because the benefits in reduced complexity costs are largely internalized to the contracting parties.”).

²⁴⁵ See *supra* note 114; DAVID A. LAX & JAMES K. SEBENIUS, *THE MANAGER AS NEGOTIATOR* 29-30, 33-35 (1986).

²⁴⁶ See Scott R. Peppet, *Contract Formation in Imperfect Markets: Should We Use Mediators in Deals?*, 38 OHIO ST. J. ON DISP. RESOL. 283 (2004).

²⁴⁷ For commercial supply chain contracting, engineers are experimenting with computer models to enable computer-to-computer negotiation over terms. Parties jointly agree on which terms are negotiable. They each privately assign values to them and disclose this information to their respective computers (but not to each other). Parties also jointly agree on negotiation rules for the computers (such as to generate a contractual result that maximizes the values for each side of the deal). The computer “agents” make offers and counter-offers continuously until one contains that set of parameters yielding the highest value to both parties. Once agreed parameters are reached, the result is mapped to a set of written contract terms resembling a familiar form of contractual writing. This example is adapted from OASIS LEGAL XML, *supra* note 1, at 28; see also Theissen, Eng & McMahan, *supra* note 215.

computer-to-computer commercial transactions within traditional contract law,²⁴⁸ may not be capacious enough to handle these more elaborate exercises. Tantalizing intellectual possibilities arise from viewpoints of game theory and bargaining strategy. Ultimately implicated are cultural, normative, and sociological consequences some might associate with science-fiction images of man against machine; others will appreciate these as promoting ideals imagined in models populated by rational economic actors, including the nexus of contracts account of the modern corporation.

CONCLUSION

Some lawyers will embrace and others will resist efforts to employ XML in corporate contracting. Needed is balance between unreflective enthusiasm for new technology and reactionary responses. Lawyers should neither blindly embrace nor blindly resist. As an example, before 1980, litigators ascertained whether judicial precedents were good law using printed books of case histories. When such information became digitized and accessible using office terminals, newly-trained lawyers embraced the system and comfortably relied upon it while veteran lawyers expressed skepticism about whether the computer had it right. No well known stories of failure have appeared.²⁴⁹

Analysis of traditional form practice and XML-based library-menu prospects shows a horizon more structured and designed more effectively to purge excess complexity in corporate contracting while guarding against oversimplification. Second-order consequences on contracting norms and contract language are potentially both real and considerable. It is possible that proprietary organizations will pioneer these efforts, despite analysis of positive and normative intellectual property law. It is responsible for the legal profession to recognize this potential and its impact on corporate contracting processes and terms.

Awareness means assuming preemptive leadership to develop public XML standards for the private law of corporate contracting. A public/private model is superior to other approaches to this standard setting context. It can incorporate interests of multiple constituencies in ways that achieve both legitimacy and accountability. It should be capable of navigating the numerous collateral effects of KXML, such as shifting power from lawyers to technologists and business persons, leveling the law firm oligarchy, and strengthening slightly the nexus of contracts account of the modern corporation.

²⁴⁸ See *supra* notes 35-36 and accompanying text.

²⁴⁹ More generally, technology enabled shifts from using pen and paper to word processing systems; from hand-delivered documents to electronic transmission; from pay phones to cell phones; from telephonic communication to electronic-mail; and from hand-made black-lining of documents showing changes to compare-write tools. See generally Conference Proceedings, *The Development and Practice of Law in the Age of the Internet*, 46 AM. U. L. REV. 327 (1996).