I call this shift the breakdown of the distinction between text and technology, or between expression and functionality, or between words and machine. A number of different developments converge to suggest such a conceptual shift. Here, I *1139 want to mention six of them: (1) the prevalent economists' view of adhesion contracts; (2) the advent of machine-made contracts; (3) the propagation of viral contracts; (4) the development of Digital Rights Management Systems ("DRMSs"); (5) the development of extensible markup language ("XML"); and (6) the legal treatment of computer programs.Date of Download: Aug 1, 2002
TP-ALL (Texts & Periodicals - All Law Reviews, Texts & Bar Journals)
70 FDMLR 1125
Copr. © West 2002 No Claim to Orig. U.S. Govt. Works

(Cite as: 70 Fordham L. Rev. 1125)
Fordham Law Review
March, 2002

Lecture

*1125 ONLINE STANDARDIZATION AND THE INTEGRATION OF TEXT AND MACHINE
[FNa1]

Margaret Jane Radin [FNaa1]

Copyright © 2002 Margaret Jane Radin

Introduction

In this essay, I consider two interrelated topics: standardization in the online environment, and the blurring of the distinction between text and machine in the digital world. I argue that this blurring is helping to break down the distinction between technological standards and legal standards. The consequences of this coalescence between technology and law will be far-reaching, or so I venture to predict.

In the first section of this essay, I will introduce the topic of standardization versus customization, and then will compare technological and legal standards. Then, in the second section, I will talk about the blurring of the distinction between text and machine, and consider some of the consequences for contract and intellectual property regimes.

*1126 I. Standardization in the Online Environment

A. Background: Standardization vs. Customization

Roughly speaking, customization involves individualization, production of a unique item, or attention to a particularized person or application, whereas standardization involves non-individualization or mass production of a class of identical items, without attention to a particular person or application. In this essay, the word "standard" refers to the specific contours of the identical exemplars in the class, the template into which all exemplars fit or by means of which they can be accurately described. [FN1]

A popular analogy for standardization and customization involves the production of clothing. Custom-made clothing is made to order, individualized, and tailored to suit a particular person. "Off the rack" clothing, however, is mass produced to one set of measurements and offered for sale on racks of identical garments. Scholars often talk about background terms prescribed by

law (for example, terms specified by the UCC for contracts) as "off the rack," meaning that they apply to everyone and are not individualized. When these terms are waivable, the parties can displace them with individualized terms, which are described as "tailored." [FN2]

Another analogy used in considering standardization and customization involves language. Language is a kind of standardization; complete individualization would preclude communication, for, as Wittgenstein argued, there is no such thing as a private language. [FN3] In order for communication to be possible, much must be shared; at a minimum there must be a community of acceptance of common descriptions and their meanings in recurring contexts. In this way of thinking about standards, each different language is a standard unto itself. The Internet is largely standardized on English, for example; and people who want to communicate using the Internet are at a disadvantage if they do not have English at least as a second language.

*1127 The language analogy also shows us that standardization and customization can be fractal in structure. That is, within the broad standard called English there can be many narrower standards that are customized from the point of view of the broad standard, but are standards from the point of view of still more finely tuned descriptions and applications. Consider dialects; and, in a legal setting, consider customized usages in various trade groups, recognized in contract interpretation by the validation of such usages. For example, "chicken" might mean a certain thing to one group of people, and it might mean something else to other people in the world who are outside that group. [FN4]

Another way to put this is that nothing is wholly customized, because that would imply a kind of complete nominalism that makes meaning impossible; and nothing is wholly standardized, because that would imply a kind of rule-like structure in which every detail is specified in advance, no matter how fine or deeply embedded, and this kind of advance prescription of details is philosophically implausible.

Both of the popular analogies--clothing and language--point up the aspect of individualization versus collectivization. Things that are customized are individualized or individuated, and things that are standardized are collectivized or shared among many. Whether something is customized or standardized depends upon perspective. A usage of trade, for example, is customized from the point of view of the general English language, but it is standardized from the point of view of those within the industry who cannot unilaterally change what the usage of trade means.

B. Comparison of Legal and Technical Standardization

There is a discourse involving legal standardization, mostly discussing standard-form--i.e., standardized--contracts. There is also a discourse involving technical standardization, mostly discussing the processes and institutions that establish and maintain technical standards. So far, though, we--cyberlaw scholars, practitioners and policy pundits, engineers of the digital environment--have not really considered legal and technical standardization together. For reasons this essay attempts to make clear, that is what we now should do.

Technical standardization is usually understood to mean uniform physical and design specifications or metrics. Plugs have two prongs that are spaced a certain distance apart, and they are all the same; they fit into sockets with holes that are sized and spaced properly, and the sockets are all the same too. This is not an accident, but the result of standards laid down by a standard-setting body such as the Institute of Electrical and Electronics Engineers Standards Association *1128 ("IEEE-SA"). [FN5] Another example is the size and format of disk drives and compact discs ("CDs")--again, not an accident, but a standard that is set. TCP/IP (Transmission Control Protocol/Internet Protocol), the base-level programming structure that runs the Internet, is also a standard. A computer cannot connect to the Internet unless it is running software that follows that particular set of instructions. As I will discuss later, standards can come about through market emergence as well as promulgation by some institution: an example is the Windows operating system. Most people use computers that run Windows and most programs are written for Windows; Windows has become a standard.

The metric system itself is a standard. Without a measuring system in common, making the pieces of the man-made physical world function together would be difficult or impossible. [FN6]

In fact, from the viewpoint of an engineer, most of our man-made physical world is standardized, and so are our methods of measuring and describing it; we inhabit an environment of standards.

Legal standardization is similarly ubiquitous; but so far we have not thought of it in terms that will point up the analogy. Legal standardization can be seen in different contexts and at different levels, once we are willing to call it that (it too exhibits the fractal structure of standardization). My thesis is that making the comparison between legal and technical standardization explicit will be helpful in reconceptualizing legal regimes for the digital environment.

What is legal standardization? At a high level of generality, there is international harmonization, the effort to bring the laws of different nations into uniformity (or greater compatibility) with each other. So, for example, when the U.S. entered the General Agreement on Tariffs and Trade, we harmonized our patent law to some extent, [FN7] changing the term to twenty years from the date of the application for the patent, [FN8] which is now the standard for all developed countries. [FN9] Prior to that our term of seventeen years from date of issuance of the patent was customized to the U.S. (viewed from a global perspective; at the *1129 same time, of course, our patent term was a standard viewed from a perspective internal to the U.S.). Similar initiatives toward harmonization--standardization--are taking place in copyright. For example, the developed countries now all grant copyright for the life of the author plus seventy years. The lengthening of the term in the U.S., accomplished by the Sonny Bono Copyright Term Extension Act, [FN10] was defended specifically with reference to a need to bring the U.S. to the level of protection existing in the European Union. [FN11]

At the national level, standardization of state law within the United States has been the explicit project of the National Conference of Commissioners on Uniform State Laws ("NCCUSL"). [FN12] The most successful of the proposed uniform state laws become national standards, as the Uniform Commercial Code ("UCC") did. Of course, some states adopted some customized provisions; and contract law interpretation is still the province of state courts, so some interpretations are customized, from the perspective of national harmonization. Many of the proposed uniform acts do not succeed in becoming a standard; for example, the Uniform Residential Landlord and Tenant Act was only adopted by twenty states, [FN13] and landlord and tenant law thus remains customized by state. The proposed Uniform Computer Information Transactions Act ("UCITA"), now pending, was promulgated by the NCCUSL but became quite controversial and was rejected by the American Law Institute and hence could not become part of the UCC. It was relabeled by its proponents as a freestanding initiative. If it becomes a uniform standard, it will be very important for transactions in the online environment. So far, however, it has only been adopted in two states. [FN14] If it does not pass in a critical mass of states, it may turn out not to be the standardization that its proponents hope for (and its opponents fear). [FN15]

*1130 At a lower level of generality, many specific legal rules or provisions can be usefully thought of as standards. A coordination rule such as "drive on the right" is a standard; and so are all the "default" provisions of commercial law, such as the provision that delivery will be at the seller's place of business if the parties do not specify otherwise. Finally, consider the existence of widespread or even uniform boilerplate contractual terms in some fields or industries. These adhesion contracts are in fact a form of standardization, one that is very important for the future of transactions in cyberspace.

C. Pros and Cons of Standardization

Is standardization good or bad from a policy point of view? Of course, the answer may depend on what we mean by "policy." We could mean economic efficiency, so in asking whether standardization is good or bad we could be asking whether standardization has the effect of maximizing our social product, social welfare, or whatever maximand your particular economic theory posits. Or, we could mean some other kind of policy, such as maximizing individual liberty or fostering human self-constitution or self-government. For now, I will leave open the big question of what policy we should focus on, and instead recount some oft-cited--standard!--good and bad characteristics of standardization. This exercise is meant to show at least that balancing is often appropriate in deciding whether a particular kind of standardization is on the

whole desirable or not; in other words, that decisions about standardization will often themselves be (relatively) customized.

What's good about standards? Often mentioned are network effects and fostering interoperability. Where network effects (also called network externalities or increasing returns) are present, the more people do the same thing or use the same thing, the more value it has for each participant. [FN16] A common example is telephone interconnection: a single telephone in the world would be of no use to the owner, but the more telephones that are interconnected (that is, able to access all other telephones), the better for each user. Another more recent standard example is the Internet protocol, TCP/IP. The more people who are on the Internet through use of this standard protocol, the more valuable the Internet is for each user.

Those are technological examples, but I think legal standardization might sometimes engender network effects too. The fact that the UCC has been enacted in all states makes it less costly for each commercial actor to interact with other commercial actors. The fact *1131 that most corporations adopt the laws of Delaware makes it less costly for corporations to interact with other corporations and with consumers. [FN17]

Compatibility and interoperability are also often cited as beneficial attributes of standardization. Interoperability is interrelated with network effects; in my examples, interconnected telephones and computers on the Internet, interoperability is what gives rise to the network effect. Interoperability can be beneficial even if not allied with network effects. Plugs and sockets were a simple example of standardization; the plug and the socket must interoperate, and that means they must be compatible. It takes a standard to accomplish that. Interoperability is very important in the world of technology if a company is not going to market an entire self-contained system. If a company is going to market cassettes for somebody else's video player, for example, the cassettes have to be the right size to fit that machine, and programmed properly so the machine will play them. The company has to manufacture its cassettes to conform to those standards. (If the maker of the machine wants to force customers to buy only its own cassettes, it may try to make it difficult or impossible for its competitor to use the necessary standard; [FN18] thus standards can implicate competition policy; but more about this later, when I discuss the downside of standardization.)

Perhaps interoperability has its analogue in law. Consider how property must interoperate with contract in order for market transactions to work. Property rules are needed in order to stabilize entitlements as a basis for exchange, and contract rules are needed in order to stabilize conditions under which exchanges will be binding. Property and contract function together to create a legal infrastructure for the market. Standardized property rules from jurisdiction to jurisdiction mesh with standardized rules of contract and facilitate the functioning of the market just as standardized plugs and sockets facilitate the functioning of electrical systems. Moreover, doctrines such as the statute of frauds and estoppel serve as bridges between property and contract. Alienability belongs both to property and contract, and non- waivability (inalienability) is a contract doctrine that in effect creates an entitlement (one that cannot be voluntarily divested).

I have been talking about the way that standardization is often thought to be beneficial, but standardization is often thought to be *1132 harmful, too. In particular, standardization is associated with the possibility of lock-in, the possibility of lock-out, and the possibility of coercion.

Lock-in is often mentioned in conjunction with standardization. An example often given is the QWERTYUIOP typewriter keyboard. This arrangement of letters is not the most efficient for fast and accurate typing, but because everyone is using it and used to it, we are locked in. [FN19] It would be difficult for us to learn a different keyboard, and a lot of other things would have to be changed as well; we would not want to switch unless everybody else switched too (coordination costs).

The QWERTY example has become traditional to illustrate lock-in caused by learning costs. There are other traditional examples of lock-in, caused more by the need for coordination or interoperability. Consider the Betamax story: this format for VCR's (and the videotapes that fit into them) was said to be superior to VHS, but once VHS attained a critical mass, everyone had

to use VHS. [FN20] The critical mass is the tipping point. Where lock-in occurs after a market tips in this way, coordination is crucial because of various important kinds of interoperability or the need for interaction with other users; when one person switches alone--even if the new technology is "better" in the abstract--she is left high and dry. Everyone must switch at the same time because of the things that the technology plugs into and the programs that are written for it, and so on. The Windows operating system exhibits this kind of lock-in; it also exhibits the kind of lock-in involving learning costs-- double-whammy lock-in.

As a legal analogue to technological lock-in, consider arcane doctrines that cannot be changed because we have all learned them and built up systems around them, and it would be too costly to substitute a new regime. In my former role as a property teacher, I often thought the common law system of estates in land might fit into that category; ditto for the common law doctrines governing covenants running with the land and equitable servitudes. Every year I would ask my students: why haven't we abolished the traditional rule against perpetuities, future interests such as contingent remainders and possibilities of reverter, and all that stuff? England abolished all this early in the twentieth century. The only explanation my students and I could ever come up with--even though it seems half facetious--is that everybody in the legislature had to learn this, everybody in the bar had to learn this, and we're stuck with it because of sunk costs and the anticipated extra costs of learning something else. One could also argue that these doctrines interoperate with *1133 others that would also have to be changed, like conveyancing, perhaps.

Suppose some state came to the conclusion that it would be better to switch to an entirely new legal regime for land entitlements, or for contracts. If no one else switched to that system, would anyone do business in the maverick state? It wouldn't matter if the new regime were theoretically better; if only one state adopted it, that state would be isolated.

Another downside risk sometimes associated with standardization is what I will call, for the sake of symmetry, "lock-out." Lock-out comes about if one firm has intellectual property rights in technology that becomes a standard. Others who need to use the standard then have to pay to use it, or else be locked out. So, for example, it is very hard to communicate with other computer users unless you pay to license the Windows operating system.

Lock-out is avoided with open standards. The Windows operating system is a closed standard, because Microsoft owns it and keeps its code secret; those who want to write programs that will plug in to it must pay Microsoft. On the other hand, TCP/IP is an open standard; everyone can use it to write programs that will mesh with the architecture that structures the Internet. The distinction between open and closed standards is an artifact of an interaction between standardization and our current intellectual property regimes. If copyright and patent regimes did not exist, then the possibility of lock-out and paying for essential standards would also not exist.

In our IP world, closed standards are a downside risk. In addition to propertization by means of copyright, as in Windows, there is also propertization by means of patent. Many business methods, and more broadly, methods of operation are patented in the online world. For example, there is a patent on the use of the shopping cart metaphor on commercial websites. [FN21] If that turns out to be a valid patent, [FN22] every vendor who maintains a website interface that has a shopping cart will have to pay a license fee to the patentee.

So these closed--proprietary--standards lock out those who do not pay. Depending on one's view of the reach of IP monopolies and of the competitive context, this may be a deleterious result. A problem that has been coming up frequently in this context is the attempt to capture an open standard and make it closed. This is one of the things *1134 that Microsoft has been accused of doing to harm its competition. In a dispute involving Microsoft and Sun Microsystems, Inc. ("Sun"), for example, Sun promulgated the Java language as an open standard so that everybody would be able to write programs in Java (the better to compete with Microsoft); but Microsoft changed Java a little bit so that those who wanted to write programs in Java compatible with Microsoft products would have to use Microsoft's proprietary version of Java. [FN23]

Are there legal analogies to this IP lock-out problem (in contexts where it is a problem)? Maybe. The scope of allowable business method patents is now very broad--anything that is an

algorithm is potentially patentable as long as it is useful, concrete, and innovative enough. [FN24] Novel legal arguments might be patentable--the possibility is not that far-fetched. [FN25] Then, whoever wanted to use the new argument might have to license it from whoever patented it. Perhaps, more realistically, a particularly good form contract or pleading might be patentable. At any rate, documents such as pleadings and form contracts can surely be copyrighted by their authors (or by the firms that employ their authors), insofar as they are copyrightable expression. [FN26]

Whoever owns IP rights in pleadings and other legal documents has an interesting choice: try to keep the documents closed and make others pay if they want to use them; or open them--put them in the public domain or grant blanket free licenses--so that they will propagate and more quickly become a standard. [FN27] Once the form contract you drafted is all over the Internet, used by everyone, this may help to validate it; i.e., turn it into an actual binding commitment instead of just a purported contract; i.e., be the mechanism by which the contract actually becomes fully functional. Do you want to capture revenue by charging people to use your form contract, or do *1135 you want to capture revenue by having your contract become a validated standard, lowering uncertainty and transaction costs?

A third downside risk associated with standardization has to do with the possibility of coercion or lack of choice. When a standard occupies the field, a user has no choice but to play by the standard if she is going to play at all. I would like to use WordPerfect for Mac, if I could, but I cannot, because if I do not use Word instead, nobody could read my documents and nobody could print them out; I have been forced to use a Microsoft product even though I would have preferred not to.

The argument about coercion or lack of choice is very familiar in the legal realm; it is the main issue that makes standardized adhesion contracts problematic from a policy point of view (at least to some people). Contracts of adhesion--that is, purported contracts, for their validity is in doubt--have proliferated in the online world. Almost every website contains a little link at the bottom of the home page labeled "terms" or something similar. If you click on these terms, you will most often see a full-blown purported adhesion contract containing much fine print, in which the user exculpates the firm for its own negligence, agrees to binding arbitration or litigation on its home turf under its home jurisdiction's law, agrees to limit damages to the price of the product, waives all warranties express and implied, and so on. To the extent that such a purported contract binds everyone who accesses the website, with no choice on their part other than to forego that website, it is a standard that forecloses choice; and to the extent that the same standard-form contract is used on many different websites, it becomes a more powerful standard, and the risk of lack of choice or coercion increases. [FN28]

D. How Do Standards Come Into Being?

Standards, whether technological or legal, can come into being by promulgation or enactment: top-down imposition by an authoritative entity. Standards can also come into being through market evolution: bottom-up emergence through operation of market forces. Or, standards can come into being in a hybrid manner, through some combination of top-down imposition and bottom-up emergence; for example, imposition by a market coalition such as a trade group.

In the legal world, promulgation or enactment--by a legislature, an executive order, or a court--is a familiar way to arrive at standards. *1136 The United States Supreme Court imposed a standard when it formulated the Miranda warnings to deal with the issue of coercion due to custodial interrogation. [FN29] Promulgation is also common in the technological world. Standards are imposed "top-down" by a standard-setting body; for example, the National Institute of Standards and Technology ("NIST") [FN30] or the IEEE-SA.

Standards, both legal and technological, can also come about through "bottom- up" market emergence. In this scenario, one standard "wins out" in a Darwinian competition for survival. As mentioned earlier, the VHS format won out over Beta, even though Beta was introduced first and was arguably a technologically superior solution. [FN31] The Darwinian logic is that once a "tipping point" is reached, the minority format must die out. [FN32] A similar scenario is

sometimes operating in the legal world. For example, clauses in corporate charters or in bonds perhaps became standardized through a process of evolution capped by a tipping point. [FN33]

Although "top-down" promulgation and "bottom-up" evolution both occur, a hybrid emergence in which a market coalition cooperates to impose a standard may occur just as, if not more, often. Negotiated rule-making is perhaps a clear example of hybrid standardization; [FN34] as are the activities of trade associations in *1137 recommending legislation. In a very similar way, these coalitions also bring about technological standards--for example, the DVD format, or the Secure Digital Music Initiative ("SDMI") that has caused so much debate. [FN35]

E. How Should Standards Be Evaluated?

As I recounted earlier, standards are, in the abstract, "good" for a number of reasons, and also "bad" for a number of reasons. I think there is practically no getting around the necessity of evaluating them in context, from a number of angles, including competition policy, freedom of choice, and other public policies. I want only to underline here that evaluation of whether standardization--whether legal or technological--is "good" or "bad" should not depend on how the standard came about. [FN36]

A good technical standard might come about through market emergence. The best product might have won out in a competitive market. Or, we might need some standard for smooth functioning, and be indifferent about which one. On the other hand, an inferior product might have tipped the market and eliminated its competitors; we could be stuck with such a product because no one else can enter unless they can somehow take over the entire market immediately.

The very same reasoning applies to legal standardization. Contracts in an industry might be standard because those are the terms that consumers consistently choose; the standardized contract represents the package of terms that won out in a free market. On the other hand, standardized contracts may reflect collusion or some other market failure such as a "lemons equilibrium" brought about by inadequate consumer information. [FN37]

Similarly, if a standard arrives by way of promulgation, that in itself also tells us nothing about how it should be evaluated. If a legal standard comes about through legislation, one might think--and courts have tended to think-- that the legislative standard is entitled *1138 to a presumption that it is socially beneficial, because it was imposed by a collective process or a representative body that takes into account everyone's interests. But we do not have to be thoroughgoing public choice theorists to note the prevalence of industry capture; and to believe that, at least some of the time, interest groups capture the process and get the statute or rule written the way they want it.

This kind of capture happens both in technical and in legal standard- setting. In the technical case, sometimes a company is helpful in getting a standard promulgated, and then it turns out the company had a patent pending, so that everyone who wants to use the standard must license the patent. [FN38] In the legal case, sometimes interest groups control the drafting process. This is arguably what happened with the anti-circumvention provisions of the Digital Millennium Copyright Act ("DMCA") [FN39]--captured by the copyright industries--or the pending UCITA [FN40]--captured by the software industry.

From a policy point of view, then, how a standard is arrived at does not tell us whether it is good or bad, whether it should be welcomed or deplored. In the real world, however, it matters a great deal how standards are arrived at, particularly for legal standards. It is a lot harder to overturn legislation once it is on the books than it is to find a reason to disallow "bottom-up" industry standardization. Not everything about either adhesion contracts or technical standardization, even if unwise, is going to turn out to rise to the level of violation of antitrust laws, federal intellectual property laws, federal consumer protection regulation, or the Constitution; in fact, very little about them will rise to that level. So, it is a very good strategy for industries to capture legislatures or standards-setting bodies, because once they get standards promulgated, it is hard to overturn them.

II. Legal and Technical Standardization and the Coalescence of Text and Machine

I believe that there is something deeper going on when it turns out that legal and technical standardization are so closely allied to each other. I believe that the digital revolution is bringing about a seismic shift in our conceptual landscape, which I want to explore here, though only preliminarily. I call this shift the breakdown of the distinction between text and technology, or between expression and functionality, or between words and machine. A number of different developments converge to suggest such a conceptual shift. Here, I *1139 want to mention six of them: (1) the prevalent economists' view of adhesion contracts; (2) the advent of machine-made contracts; (3) the propagation of viral contracts; (4) the development of Digital Rights Management Systems ("DRMSs"); (5) the development of extensible markup language ("XML"); and (6) the legal treatment of computer programs.

A. Contract as Product

The prevalent economic view of contract has broken down the distinction between agreement, formerly thought of as a text, and the product being sold, formerly thought of as a functional object or a collection of functional features. This view of contract actually predates the online environment, [FN41] but in the online environment it is becoming more powerful. I call this view "contract as product," and contrast it with the view of contract as consent or agreement. [FN42]

In the "contract as product" view, the contract is part of the product, part of the collection of functional components, and not a separate text about that collection. What does this mean? For example, suppose you buy a cell phone that contains a chip that will wear out within a year, and the phone comes with a set of fine print terms including a clause that says in the event of any dispute arising out of the transaction you must litigate in California under California law. Both the chip and the clause are functionally the same from the economic point of view: if you know that they are there, they will help determine what you are willing to pay for the phone. Notice that in order for the market to function efficiently this view must suppose that at least the marginal consumer must understand what chips and clauses are being purchased. How the product will work, how long it is going to last, what kind of warranties it comes with, what limitations on remedies it comes with--all of these are exactly the same from the economic point of view. The product you are buying is not just the phone, but the phone plus the terms. The contract is not a text about a product, but part of a product.

This contract as product view is suited to adhesion contracts because in such a take-it-or-leave-it transaction there is no dickering over terms and no dickering over the components either. You can buy this product that is going to wear out in a year, over which you will be forced to litigate in California if a dispute arises, or you can walk away and buy something else more to your liking. In order for the market to function efficiently, in this view, one must suppose that other products and/or other terms are available. You don't get to say, "I wish you would remanufacture this so it will not wear out in a *1140 year," and you also don't get to say, "I wish you would rewrite the contract so that I can litigate in my home state."

In the offline world, most contracts [FN43] have been like this for some time, and thus the economic view has suited transactional reality. Nevertheless, lay people have largely continued to conceive of contract as dickered consent between two people. This lay conception--contract as negotiated text--will, I think, be significantly eroded in the online environment, for two reasons. On the one hand, it is likely that standardized transactions will occupy even more of the transactional universe; [FN44] and on the other hand, the nature of the transaction is more transparent because the fine print that comes with the functionality being purchased is more accessible to everyone. The contract is merging into the product; the text is merging into the functionality.

B. Machine-made Contract

The advent of machine-made contracts--the use of programs to create binding commitment--is hastening the breakdown of the distinction between text and machine. Consider business-to-business ("B2B") electronic commerce and the overall transformation of supply-chain management. Manufacturing is becoming ever more automated, and the advent of the machine-

made contract completes the picture by automating the supply process. If some computer processor "realizes" that more supplies are needed at a certain part of the assembly process, it can also search certain suppliers and see which can most readily supply what is needed, and it can give the go-ahead for the supplies to be delivered. Computers at each end of the transaction could be programmed with sets of terms; when the buyer computer encounters a seller computer, they could enter into a computerized handshake protocol, and if they determine that they have a set of terms in common they could arrive at a commitment, without a human being having to sign off on it. [FN45] I think this procedure is going to turn out to be so efficient that it will in fact become the contracting norm in B2B transactions. When (if) this transformation does occur, it will help undermine the distinction between the text and the machine, because computerized contracting will be seen to be integrated with general computerized management of manufacturing processes.

*1141 C. Viral Contracting

Perhaps the process of integration of text and machine is even clearer in the case of what I call viral contracting. Viral contract--or purported viral contract, because the legal validity of this procedure is not yet determined-- occurs when a digital product has digital terms integrated with it, and the product-plus-terms propagates down a chain of distribution, with the intent that the terms be binding on whoever comes into possession of the package. The digital product could be a software program or some other kind of content that someone wishes to propagate. Integrated with such a digital product could be digitally programmed terms that purport to constrain use of the digital product--for example, prohibition of criticism of the program, or prohibition of reverse engineering. [FN46] The economists' contract-as-product view is here brought to fruition; the digitized product and the digitized terms are literally (not just conceptually) the same in kind and part of a package. Not only does such a package undermine the distinction between text and functionality, it seems difficult to maintain the distinction at all. That is, at this point it seems arbitrary to call one set of programming statements a functional product and another set of programming statements a text.

D. Digital Rights Management Systems

It also seems that DRMSs are doing their part to undermine the distinction between text and machine. A DRMS is a program that limits distribution and use of some piece of digitized content; it is essentially next-generation copy protection. [FN47] That is, a DRMS could prevent content from being copied, or allow it to be copied once and sent to one recipient, but deleted from the original recipient's computer; or it could delete the content after a set time period; and many other permutations. DRMSs give rise to many policy problems that I am not discussing here, in particular the problem of *1142 overreaching by content owners who can use technological protection to prevent activities that are otherwise the right of the user (for example, copying of material that is not protected by copyright). [FN48] At least it seems that DRMSs are also contributing to the undermining of the idea that a contract is a text, separate from and accompanying some machine or functionality. The DRMS is itself a machine or functionality, and it is not at all clear whether to think of it as a contract; to me it seems like non- contractual technological self-help. [FN49]

E. Functional Computer Languages

Another development that seems to fit into the general pattern of absorbing contract into machinery is the development of computerized languages such as XML. XML is a language that can tag significant functional digitized texts. [FN50] The purpose of XML is to make possible efficient searches in electronic commerce. For example, if every web store that had an umbrella for sale used codes that tagged the item as an umbrella, it would be possible to use my browser to search directly for umbrellas, and receive a listing of all umbrellas for sale. It seems clear that the same tagging procedure could be used for digitized texts that represent legal terms. For example, a code at the beginning and end of the fine print could designate it as a "contract." More usefully, perhaps, a code at the beginning and end of a particular clause could designate it

as a "choice of law clause." With these tags, my browser could be used to search for all choice-of-law clauses.

The result of widespread deployment of XML-type tags would be that one could search for the exact products needed and, in the very same way, one could also search for the exact clauses desired. Here again there is no difference between functionality and (what was formerly conceived of as) text. The result, if it comes to pass, will be that consumers could search for products they like and warranties they like in exactly the same way. Attorneys could search all clauses used by others and replicate the ones they like (which might have the effect of propagating clauses that attorneys like, or think best for their clients).

*1143 F. Computer Programs and Intellectual Property

I have been giving a few examples of what I think is a widespread breakdown of the distinction between text and technology, text and functionality, text and machine, owing to the basic fact that digitization makes no such distinction. My examples have related to contract. But meanwhile, perhaps the clearest example has already occurred to you: the anomalous dual treatment of computer programs in intellectual property law.

Computer programs are both text and machine. They are text when considered as code statements, they are machines when considered as devices for accomplishing a task. Copyright law reflects the text perspective (programs are considered literary works); [FN51] patent law reflects the machine perspective (a programmed computer is a "new machine"). [FN52] The fact that computer programs are both copyrightable and patentable is anomalous for intellectual property law. Copyright is supposed to exclude works that are functional; [FN53] patent is supposed to focus on functionality and exclude texts. [FN54] Computer programs are the only large area covered both by patent and copyright. This anomaly is obscured to some extent by the fact that copyright and patent regard programs differently: patent focuses on the protocol for accomplishing the task, however the programmer chooses to code it, whereas copyright focuses on the code statements, but also their structure, sequence and organization. The difference between structure, sequence and organization (copyrightable) and useful algorithm, protocol or method (patentable) is, however, conceptually difficult to maintain. This difficulty reflects the fact that computer programs can be understood either as text or machine. Those who write code sometimes genuinely feel that it is their speech and should be protected by the First Amendment. [FN55] At the same time, it is clear *1144 that the primary raison d'etre for programs is their technological function, their ability to accomplish a task.

To summarize what I have been saying: the fact of digitization of both texts and technologies is contributing to the breakdown of the distinction between the two. Part of this breakdown is signified by the parallelisms between legal and technical standardization. Put another way, the integration of legal and technical standardization is one aspect of the integration of text and technology.

Conclusion: How Should We Think About Standardization and Customization Online?

As discussed earlier, the online environment facilitates standardization in various ways. On the other hand, it is clear that new kinds of customization are possible--technologically feasible--in the online environment. The functionality that is supplied can be customized: for example, manufacturing computers to order. Content (textual products) can also be customized, geared toward the users' tastes or political views. [FN56] In the same way, customization of terms and conditions is possible. Instead of a take-it-or- leave-it set of fine print terms, a website could offer a menu of choices for various clauses, and the user could check boxes for which ones were desired. One might choose the warranty disclaimer (free) or the two-year warranty (pay $1 extra); one might choose to accede to the arbitration clause (free) or the clause allowing litigation in one's home state (pay $2 extra).

This kind of customization of terms offline is, to some extent, already apparent (purchasing service contracts or extended warranties on big-ticket items, for example). It would be inexpensive to do the same thing online even for small transactions, because the process of

implementing such a program could be outsourced to a third party specializing in such programs and seamlessly integrated with the purchase process at the e-commerce website. [FN57] Online customization could be facilitated by the use of languages such as XML that make it *1145 technologically feasible to search and assemble particular components.

Of course, whether such customization will come to pass depends upon whether there will be market demand for it (whether people will want to use it), and that we do not yet know. If it does come to pass, contract to some extent can turn back toward the traditional understanding that still lingers, which is that contract involves negotiation and agreement between two willing parties. On the other hand, the situation could turn instead to more standardization, and the traditional understanding of contract could be further eroded. Standardization is fostered by the advent of machine-made contracts, because the computers that enter into them are going to need sets of standardized terms; and then these sets of terms that become widespread in B2B may propagate into Business to Consumer ("B2C") transactions as well. In a context of uncertainty about validity of terms, those that are widely used will come to be approved by courts or regulatory bodies. XML tags will help propagate such terms. As people copy them and use them because they seem to be workable, such terms will become more certain and more workable, and thus adoption could snowball. (This is a species of network effect with contract terms.) There is a strong possibility, I think, that there will be even more standard-form contracts and less customization in the digital environment, even though customization is technically possible.

We have rehearsed the policy concerns with regard to standardization, either technical or legal, and they have to do with the eroding of user autonomy and choice. But customization has its own set of serious policy issues. It could turn out that firms will offer very low-quality legal/technological packages (minimal functionality and onerous terms) and allow customers to check boxes and pay more money for better functionality and better terms. Such a situation will push the haves and have-nots further apart, because it seems predictable that the haves will check the boxes to pay more money, and the have-nots will not. In this situation, warranties are for the well off.

At this point in the evolution of e-commerce, all I want to do is point out that these policy debates about online customization versus standardization could replicate debates we have had before in the offline environment, about such things as whether or not there should be a non-waivable implied warranty of habitability in rental housing; whether consumers should be able to waive tort liability; and so on. We can see these issues coming--whether or not online privacy is a waivable entitlement is one such issue--so let's not reinvent the wheel in how we debate them.

Standardization versus customization in the online environment does raise new versions of some old questions. I think, however, that *1146 it raises some new questions too, or at least brings to the surface some basic questions that have previously been submerged, such as the future of consumer choice and consent, and how to evaluate the market versus other processes by which standards are created. In facing these questions, it will be helpful both to understand the dissolution of the distinction between text and technology in the online environment and, in light of that understanding, translate our understanding of the pros and cons of technical standardization into our understanding of the pros and cons of legal standardization.

[FNa1]. (c) 2002 by Margaret Jane Radin. Permission is hereby granted to reproduce and distribute this Article in whole or in part for personal, professional or educational purposes, provided such copies are disseminated at or below cost, provided that each copy bears this notice, and provided that the Fordham Law Review is credited as the original published source.

[FNaa1]. William Benjamin Scott & Luna M. Scott Professor of Law and Director, Program in Law, Science and Technology, Stanford Law School, www.law.stanford.edu/faculty/radin. An earlier version of this essay was presented on March 29, 2001, as the Robert L. Levine Distinguished Lecture at Fordham University School of Law. I was honored by the invitation, and am grateful for the helpful comments by faculty and students in response to it. I am

especially indebted to my research assistant, Kevin E. Collins, and to Ajay Ayyappan of the Fordham Law Review, for their help in the transition from lecture to essay.

[FN1]. Perhaps confusingly, the word "standard" is used in a contrary sense in jurisprudential discourse distinguishing "rules" from "standards." In that discourse, a "standard" implies particularized judgment by a decision maker, whereas a "rule" implies absence of decision-making discretion for a class of cases. See, e.g., Duncan Kennedy, Form and Substance in Private Law Adjudication, 89 Harv. L. Rev. 1685, 1687-89 (1976) (discussing the "formal realizability" of rules); Kathleen M. Sullivan, The Justices of Rules and Standards, 106 Harv. L. Rev. 22, 58-59 (1992). Thus, a "standard" in the sense used in this essay is actually rule-like from the point of view of that jurisprudential discourse.

[FN2]. See, e.g., Ian Ayres & Robert Gertner, Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules, 99 Yale L.J. 87, 91-92 (1989) (describing "tailored defaults" in the context of contract law).

[FN3]. Ludwig Wittgenstein, Philosophical Investigations §§ 256-81 (G.E.M. Anscombe trans., Oxford 1968).

[FN4]. See Frigaliment Importing Co. v. B.N.S. Int'l Sales Corp., 190 F. Supp. 116 (S.D.N.Y. 1960).

[FN5]. See IEEE Standards Association: Overview, at http:// standards.ieee.org/sa/sa-view.html (last modified Mar. 9, 2001).

[FN6]. A costly embarrassment for NASA occurred recently when a spacecraft malfunctioned because thruster firing data using the English system of measurement were input into a navigational program that expected metric data. Kathy Sawyer, Engineers' Lapse Led to Loss of Mars Spacecraft; Lockheed Didn't Tally Metric Units, Wash. Post, Oct. 1, 1999, at A1.

[FN7]. The Agreement on Trade-Related Aspects of Intellectual Property ("TRIPS") which contained the patent harmonization provisions was included in the GATT bill that became effective on June 8, 1995. Kevin Cuenot, Note, Perilous Potholes In The Path Toward Patent Law Harmonization, 11 U. Fla. J.L. & Pub. Pol'y 101, 110 nn. 53-56 (1999).

[FN8]. 35 U.S.C. § 154(a)(2) (2001).

[FN9]. See supra note 7.

[FN10]. Sonny Bono Copyright Term Extension Act, Pub. L. No. 105-298, Title I § 102(b), 112 Stat. 2827 (codified as amended at 17 U.S.C. § 302(a) (1998)).

[FN11]. Council Directive 93/98/EEC, 1993 O.J. (L 290) 9 (specifying a copyright term of life of the author plus seventy years), available at http:// europa.eu.int/smartapi/cgi/sga_doc.

[FN12]. National Conference of Commissioners on Uniform State Laws, About Us, at http://www.nccusl.org/nccusl/aboutus.asp (last visited Sep. 27, 2001).

[FN13]. National Conference of Commissioners on Uniform State Laws, A Few Facts About... The Uniform Residential Landlord and Tenant Act, at http:// www.nccusl.org/nccusl/uniformact_factsheets/uniformacts-fs-urlta.asp (last visited on Sept. 27, 2001).

[FN14]. UCITA Online, What's Happening to UCITA in the States, at http://www.ucitaonline.com/whathap.html (last updated Oct. 8, 2001) (noting that UCITA has been passed in Maryland and Virginia).

[FN15]. For one discussion of the policy implications of UCITA, see Symposium: Intellectual Property and Contract Law in the Information Age: The Impact of Article 2B of the Uniform Commercial Code on the Future of Transactions in Information and Electronic Commerce, 13 Berkeley Tech. L.J. 809 (1998), available at, http://www.law.berkeley.edu/journals/btlj/articles/vol13.html.

[FN16]. See generally Michael L. Katz & Carl Shapiro, Systems Competition and Network Effects, 8 J. Econ. Persp. Spring 1994, at 93 (providing a basic exposition of the economics of systems displaying network effects).

[FN17]. Marcel Kahan & Michael Klausner, Standardization and Innovation in Corporate Contracting (Or "The Economics of Boilerplate"), 83 Va. L. Rev. 713, 719-29 (1997) (discussing the benefits of standard terms in contracts and Delaware law as the source of commonly used corporate terms).

[FN18]. See, e.g., Sega Enterprises Ltd. v. Accolade, Inc., 977 F.2d 1510, 1514-17 (9th Cir. 1992) (illustrating how Sega used an initialization code in its software to ensure that only licensees could attain compatibility).

[FN19]. Paul A. David, Clio and the Economics of QWERTY, Am. Econ. Rev. (Papers and Proceedings), May 1985, at 332, 332-37.

[FN20]. Bill Mandel, One Last Lament for the Beta Format, an Idea Whose Time Has Gone, Chi. Trib., Jan. 27, 1988, at 17.

[FN21]. Scott Thurm, Online: A Flood of Web Patents Stirs Dispute Over Tactics, Wall St. J., Oct. 9, 1998, at B1.

[FN22]. Patents that become very valuable usually become the subject of litigation; it is only after litigation that one knows for sure whether a patent is valid. A recent study shows that validity is almost a coin-flip: litigated patents are held valid slightly over fifty percent of the time. John R. Allison & Mark A. Lemley, Empirical Evidence on the Validity of Litigated Patents, Am. Intell. Prop. L. Ass'n. Q.J., Summer 1998, at 185, 205.

[FN23]. Sun Microsystems, Inc. v. Microsoft Corp., 188 F.3d 1115, 1117 (9th Cir. 1999).

[FN24]. AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 1356-58 (Fed. Cir. 1999) (explaining the requirements for patentability of algorithms).

[FN25]. The Patent and Trademark Office has granted patents on methods for teaching certain subject matter with greater efficiency. These precedents could extend to methods for deploying legal arguments to convince a judge (merely an exercise in educating the judge as to the strength of a legal position) with greater efficiency.

[FN26]. That is, original enough and characterizable as protectable expression, not subject to defenses such as merger and scenes a faire.

[FN27]. It is not fanciful to think that legal documents will be copied and reused by others. Stanford Law School's Securities Class Action Clearinghouse website has posted all the pleadings that are available in securities class action lawsuits. See Stanford Law School

Securities Class Action Clearinghouse, at http://securities.stanford.edu (last updated Jan. 4, 2002). Once those pleadings are readily available, the near-monopoly of a particular specialized firm is broken, because other firms can submit substantially similar pleadings without having to develop them from scratch.

[FN28]. The problem of lack of choice or coercion is not very salient when market substitutes exist that are not governed by the particular terms, because the consumer can purchase equivalent goods or services on other terms from other vendors, assuming she is somehow made aware of the terms--though that is surely a big assumption. The problem becomes more significant as a policy matter if the terms cannot be avoided without foregoing the product or service that the consumer needs or wants.

[FN29]. Remember that (unfortunately) the Miranda warnings would be called a "rule" in the rules-and-standards type of jurisprudence mentioned earlier. See supra note 1. In that parlance, a "standard" to take care of the problem of coercion in custodial interrogation would vest discretion in the police to treat suspects reasonably. I have long thought that the rules-and-standards terminology is philosophically misleading and should be eschewed. See Margaret Jane Radin & Frank Michelman, Pragmatist and Poststructuralist Critical Legal Practice, 139 U. Pa. L. Rev. 1019, 1053-55 (1991) (arguing for the deconstruction of the rules/standard distinction). And, in spite of the confusion my use here might at first engender among jurisprudes familiar with rules-and-standards terminology, I think, for reasons I hope this essay will make clear, that it is going to be important to recognize that rules such as the Miranda warnings are powerful standards in the same sense as technological standards such as specifications for plugs and sockets.

[FN30]. See National Institute of Standards and Technology, General Information, at http://www.nist.gov/public_affairs/general2.htm (last updated Jan. 3, 2002).

[FN31]. Mandel, supra note 20.

[FN32]. See Nicolai J. Foss, Austrian and Post-Marshallian Economics: The Bridging Work of George Richardson, in Economic Organization, Capabilities and Co-ordination: Essays in Honour of G.B. Richardson 138 (Nicolai J. Foss & Brian J. Loasby eds., 1998); Mark J. Roe, Chaos and Evolution in Law and Economics, 109 Harv. L. Rev. 641, 641-42 (1996).

[FN33]. Michael Klausner, Corporations, Corporate Law, and Networks of Contracts, 81 Va. L. Rev. 757, 767-69 (1995) (explaining the Darwinian process by which contract terms become standardized).

[FN34]. Jody Freeman & Laura I. Langbein, Regulatory Negotiation and the Legitimacy Benefit, 31 Envtl. L. Rep. 10811, 10811 n.1 (2001) (stating that, "'negotiated rulemaking'... refer[s] to the specific process by which agencies formally negotiate rules.... [S]ome scholars and practitioners use the term 'regulatory negotiation' more broadly to refer to virtually any dialogue process that involves a regulation").

[FN35]. In an effort to enforce more rigorously the interests of copyright holders in digital music played on portable devices, a coalition of music, electronics, and computer companies sought to establish a standard that would allow portable music players to interoperate with digital music files and discriminate between "legitimate" (i.e., watermarked) and "illegitimate" copies. Don Clark, Digital Music Standards Are Adopted in an Effort to Protect Against Piracy, Wall St. J., June 29, 1999 at B9. The concretization of technological standards, however, has proven difficult. As of the summer of 2001, "there is currently no consensus for adoption" of "technologies to be used in the protection of digital music." Secure Digital Music Initiative,

SDMI Reviews Screening Technology Needs, at http://www.sdmi.org/pr/Amsterdam_May_18_2001_PR.htm (May 18, 2001).

[FN36]. Margaret Jane Radin, Humans, Computers, and Binding Commitment, 75 Ind. L.J. 1125, 1148 (2000).

[FN37]. George A. Akerlof, The Market for "Lemons": Quality Uncertainty and the Market Mechanism, 84 Q.J. Econ. 488, 490-91 (1970).

[FN38]. Michael J. Schallop, The IPR Paradox: Leveraging Intellectual Property Rights to Encourage Interoperability in the Network Computing Age, Am. Intell. Prop. L. Ass'n Q.J., Summer 2000, at 195, 283-84 (discussing standard manipulation by companies that have patents pending).

[FN39]. 17 U.S.C. §§ 1201-04 (2000).

[FN40]. See supra note 14.

[FN41]. See, e.g., Lewis A. Kornhauser, Unconscionability in Standard Forms, 64 Cal. L. Rev. 1151, 1153-54 (1976).

[FN42]. Radin, supra note 36, at 1125-26.

[FN43]. In fact, I start my contracts class by bringing in contracts that I have unwittingly entered into in the past few weeks--the back of a FedEx slip, a parking lot ticket, an airline ticket, etc.

[FN44]. There are pressures that I think will lead to greater standardization; but greater customization is also possible. See infra text accompanying notes 56-57.

[FN45]. This will work for many run-of-the-mill transactions. Sometimes, however, human intervention will be needed, and it may be difficult to program computers to "know" when to call in a human. Radin, supra note 36, at 1137.

[FN46]. The contractual assurances that earlier coders give to later coders under the General Public License ("GPL") is one example of a widely discussed viral contract currently in use. In theory, the earlier coders' contributions to a software program give these earlier coders property rights under copyright law to exclude later coders from modifying the program--making a derivative work--or from distributing the code. (These property rights depend on the later coders' creations being a "derivative work" of the earlier coders' programs.) Although some prefer to conceive of the GPL as a grant of defeasible property rights, I think it is best viewed as a contractual license that gives the later coders permission to modify and distribute the program if they perform certain affirmative obligations, primarily making their source code available to everyone in a distributional community. Whether the contract is valid as between an early coder and a later coder who begins with a version of the program already modified several times since the earlier coder made his contribution has yet to be determined by the courts.

[FN47]. Mark Stefik, Shifting the Possible: How Trusted Systems and Digital Property Rights Challenge Us to Rethink Digital Publishing, 12 Berkeley Tech. L.J. 137 (1997).

[FN48]. Julie E. Cohen, Examined Lives: Informational Privacy and the Subject as Object, 52 Stan. L. Rev. 1373, 1389-90 (2000) (discussing the use of DRMSs to impose "unwarranted burdens on [the] users of copyrighted works").

[FN49]. One could argue that the consumer decides whether or not to purchase the content-plus-DRMS package, and that this decision is contractual. Radin, supra note 36, at 1138. At a minimum, this kind of "contract" strengthens the contract-as-product view, and, as I am arguing, helps dissolve the distinction between text and machine.

[FN50]. Jane K. Winn, Making XML Pay: Revising Existing Electronic Payments Law to Accommodate Innovation, 53 SMU L. Rev. 1477, 1480-81 (2000).

[FN51]. See, e.g., Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240, 1249 (3d Cir. 1983) (quoting the definition of literary work in 17 U.S.C. § 101--which includes expression comprised of "'numbers, or other...numerical symbols or indicia"'--and holding object and source code to be literary works).

[FN52]. In re Alappat, 33 F.3d 1526, 1566-67 (Fed. Cir. 1994) (Archer, C.J., concurring and dissenting).

[FN53]. Dennis S. Karjala, The Relative Roles of Patent and Copyright in the Protection of Computer Programs, 17 J. Marshall J. Computer & Info. L. 41, 52-53 (1998) (describing the functionality limitations of copyright doctrine and its application to computer programs).

[FN54]. See, e.g., Patent and Trademark Office, United States Department of Commerce, Examination Guidelines for Computer-Related Inventions: Final Version, available at http://www.uspto.gov/web/offices/pac/dapp/oppd/pdf/ciig.pdf (distinguishing between sometimes patentable "functional descriptive" subject matter and categorically unpatentable "nonfunctional descriptive" subject matter).

[FN55]. Lawrence Lessig, Copyright's First Amendment, 48 U.C.L.A. L. Rev. 1057, 1059-61 (2001). But see R. Polk Wagner, The Medium is the Mistake: The Law of Software for the First Amendment, 51 Stan. L. Rev. 387, 404-05 (1998) (arguing that software is not speech for First Amendment purposes). This issue is being actively debated by the courts. Compare Universal City Studios, Inc. v. Reimerdes, 111 F.Supp.2d 294, 327-33 (S.D.N.Y. 2000) (holding free speech interests insufficient to overturn restrictions imposed by the DMCA on the dissemination of code that circumvents a DRMS), aff'd Universal City Studios, Inc. v. Corley, 273 F.3d 429 (2d Cir. 2001), with DVD Copy Control Ass'n v. Bunner, 113 Cal. Rptr. 2d 338 (Cal. Ct. App. 2001) (overturning a trade secret-based injunction on the dissemination of computer code on First Amendment grounds).

[FN56]. Cass Sunstein has argued that this form of online customization may, due to the lack of any necessary contact with the equivalent of the public forum when online, polarize debate and undermine the republican values on which the First Amendment was built. Cass Sunstein, Republic.com 89-103 (2001).

[FN57]. The third party would run a program that would continually calculate actuarially how much it should cost to have a better warranty, taking into account experience factors. Such a third party would be analogous to the third parties that implement banking transactions.
END OF DOCUMENT