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THROUGH THE TELESCOPE II: THE MEANING OF UCITA*

Lorin Brennan**

I. INTRODUCTION

What was the crime of Galileo? It was not merely that he taught the Copernican heresy. Copernicus' speculations had been known for nearly seventy years, but were dismissed by the cognoscenti as idle speculations buried within mathematics of bewildering complexity. No, Galileo's crime was that he proclaimed the truth of Copernicus' theory and had the nerve to prove it with his telescope.¹

Our mental images affect how we think about the world. In Galileo's time, it seemed natural to see the Sun move across the sky and to imagine that it circled the Earth. Great reputations and lucrative careers hinged on continued public adherence to this image. When Galileo challenged this world view, he threatened those entrenched interests to the core.

The Uniform Computer Information Act ("UCITA") also challenges established orthodoxy. UCITA proposes new ways of thinking in order to deal with the transition from an industrial to an information-based economy. Naturally, there is "controversy," but, on closer inspection, one finds that the dispute surrounding UCITA is not so much with what UCITA *says*, which is by and large common sense, but with what it *means*—which is something else entirely.

The previous installment of this Article discussed the emerging e-commerce revolution, the move from competitive to cooperative bargaining, and the role of UCITA (then known as Article 2B) in the process. The revolution steam-rolls on. New developments make e-contracting more vibrant than ever. This Article invites you to do what Galileo did: Look through the telescope.

II. THE MOONS OF JUPITER: NEW IMAGES OF CONTRACT

When Galileo looked through his telescope, he saw startling new images invisible to the naked eye: moons circling Jupiter. This discovery directly contradicted his notion of a fixed and immovable Earth at the center of the Universe around which all planetary bodies revolved. What is our fixed image of a typical software transaction?

A. Software Imagineering

When we think of a software purchase, we usually think of a customer who acquires pre-packaged software with a "shrinkwrap" license. Such a transaction

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1. See GIORGIO DE SANTILLANA, *THE CRIME OF GALILEO* (1955).

has all the look and feel of a “sale of goods,” and thus seems to fit within Article 2 of the Uniform Commercial Code. In a more recent variant, the customer accesses a web page, clicks an “I Agree” icon in a dialog box containing a license, and downloads (copies) the software. While such a transaction looks a little different because it deals with electrons moving over a wire, there is still some authority that electricity is a “good,” so the transaction should fit within the outer edges of the mold. As one court explained, “[t]hat a computer program may be copyrightable as intellectual property does not alter the fact that once in the form of a floppy disc or other medium, the program is tangible, moveable, and available in the marketplace.”² In other words, software transactions look like they fit within the realm of Article 2, where everything revolves around the fixed notion of a sale of goods. It is a comforting image—and it is a spectacularly *wrong* image. Before discussing the legal reasons why this is so, let us use our Web telescope to set firmly in our minds the correct image of a software transaction.

The most dramatic illustration of the real nature of a software transaction is Linux.³ Linux is a Unix-type operating system originally created by Linus Torvalds with the help of other developers worldwide. Like many other programs, Linux is distributed without charge under the “open source” GNU General Public License. This Article will not repeat all of the terms of this license, but it will be helpful to view the license in your Web-scope as you read along, as it is critical to understanding software transactions.⁴ Basically, this license lets others copy, modify, and redistribute copies of Linux, without charge, provided that the supplier makes the source code available and disclaims all warranties. The warranty disclaimer is crucial because the creators of Linux do not support the software (they let the users do that) and do not want to be responsible for modifications by others.

The Linux Organization allows the downloading of Linux from its site but does not provide packaged copies to retail stores. Several third-party vendors, however, do provide retailers with packaged software, such as Red Hat and Symantec. These vendors all use “shrinkwrap” or “click on” licenses, as required by their license for Linux. I have a CD from Walnut Creek Software. Some copies, like mine, come with a full waiver of all warranties, but then my CD was priced at under \$20. Other vendors provide their copies at a higher price, but they also offer limited support. This means that when a customer acquires a packaged copy of Linux, two separate legal events occur. The customer *buys a copy of Linux* from a vendor, such as Walnut Creek, and independently *obtains a license* to use the embodied computer program. These are distinct legal events. The purveyor of the copy (e.g., Walnut Creek Software) is not the owner of the embodied computer program (the Linux Organization).

2. *Advent Sys., Ltd. v. Unisys Corp.*, 925 F.2d 670, 675 (3d Cir. 1991).

3. See *Linux Online!* (last modified Jan. 28, 2000) <<http://www.linux.org/>>.

4. See *Linux Online!* (last modified July 16, 1999) <<http://www.linux.org/info/gnu.html>>; see also Free Software Foundation, GNU's Not Unix (last modified Feb. 3, 2000) <<http://www.fsf.org/>>; Robert N. Gomuldiewicz, *How Copyleft Uses License Rights to Succeed in the Open Source Software Revolution and the Implications for Article 2B*, 36 HOUS. L. REV. 179 (1999).

Notice how this transition directly contradicts the fixed idea that a computer program, when embodied in a floppy disc, loses its separate identity and becomes entirely a "good." In the case of Linux, the transfer of the *copy* from Walnut Creek or Symantec transfers not one iota of interest in the *computer program*. The mere fact that Walnut Creek happens to make a copy does not make Linux "tangible, moveable, and available in the marketplace." Linux, the computer program, still remains an *intangible, copyrighted work*. Linux, the computer program, has not moved from the Linux Web page even though it was copied. To the contrary, as a copyrighted work Linux continues to exist simultaneously and immovably everywhere its copyright can be enforced. Finally, if the copy made by Walnut Creek does not conform to the requirements of the GNU Public License, then that copy is unauthorized, its distribution is infringing, and thus it is definitely not "available in the marketplace."

B. Enter the Copyright Act

That a computer program is not merely a disc or CD follows directly from section 202 of the Copyright Act of 1976 which provides:

Ownership of a copyright, or any of the exclusive rights under a copyright, is distinct from ownership of any material object in which the work is embodied. Transfer of ownership of any material object, including the copy or phonorecord in which the work is first fixed, does not of itself convey any rights in the copyrighted work embodied in the object; nor, in the absence of an agreement, does transfer of ownership of a copyright, or any of the exclusive rights under a copyright, convey property rights in any material object.⁵

Copyright has sometimes been described as the metaphysics of the law, and if that is true then this is its fundamental metaphysic: a *copy* is not a *copyright*. A book is a physical copy of a separate, intangible, copyrightable literary work; a compact disc is a copy of a separate, intangible, copyrightable computer program. The principle is almost Platonic. A physical *copy* is but a single instance of an abstract, intangible idea called a copyrightable *work*. The instance is not the essence. The copy is not the copyright.

Section 202 also addresses an important point regarding copyright licenses. Before enactment of the Copyright Act of 1976, there was a dual system of state common law and federal statutory copyright. Under common law copyright, transfer of a physical object, such as a manuscript or work of art, was presumed to transfer the common law copyright as well.⁶ Section 301 of the Copyright Act preempted state common law rules. This means that, as a matter of preemptive federal law, there can be no presumption that transfer of a *copy* transfers any

5. 17 U.S.C. § 202 (1988).

6. See MELVILLE B. NIMMER, NIMMER ON COPYRIGHT § 10.09[B] (1978) (citing cases).

right under the copyright. Paying for a copy does not in itself give the buyer any license to use the copyright.⁷ This applies regardless of whether the transfer is an exclusive license⁸ or a non-exclusive license.⁹ The statement in *Advent Systems Ltd. v. Unisys Corp.* that, "once in the form of a floppy disc or other medium, the program is tangible"¹⁰ is directly contrary to Section 202. The *copy* is tangible, not the copyrighted *computer program*.

There is a qualification to this rule, however. Under the Copyright Act, the owner of a copy has certain limited privileges to use the copy without infringing the copyright in the embodied work, such as "fair use"¹¹ and the "first sale doctrine."¹² Section 202 does not affect these privileges. Section 202 says that buying a copy of a computer program, for example, gives no right to exercise an interest in the copyright of the program beyond the limited privileges under the Copyright Act that go with ownership of a copy.

Given this difference, what exactly does it mean to say that Article 2 applies to software transactions? Think again about the customer who acquires a pre-packaged copy of Linux. One response to the question could be that the transaction, "in its entirety," is really a "sale of goods." But such an answer assumes that the sale of the *copy* also made an effective *copyright* license. This is precisely what Section 202 of the Copyright Act says cannot be done.¹³

When all is said and done, the real reason for trying to apply Article 2 to software transactions is to invalidate shrink-wrap and click-on licenses. But if these licenses are unenforceable, then making and distributing the retail copy of Linux by Walnut Creek or Symantec is unauthorized, the customer's use of Linux is unauthorized, and both the customer and the supplier are copyright infringers. There is no "bona fide purchaser" defense to copyright infringement.¹⁴ My copy of Linux includes Apache, a widely used web-hosting program also provided under an open source license. If all shrink-wrap licenses are unenforceable, then a significant number of Web users are copyright infringers as well. This is an absurd result.

Obviously, some law must apply to the entire transaction. If Article 2 is not this law, the only remaining choice is the common law of contract. But state common law is not uniform; it is far too general for the specific needs of com-

7. See *Saxon v. Blann*, 968 F.2d 676, 680 (8th Cir. 1992) (stating "under Section 202 . . . the conveyance of 'ownership rights' to a book will not convey the copyright of the book"); *Marobie-FL, Inc. v. National Ass'n of Fire Equip. Distribs.*, 983 F. Supp. 1167 (N.D. Ill. 1997) (purchasing of diskette containing copyrighted clip art did not allow downloading clip art onto web page).

8. *Saxon*, 968 F.2d 676.

9. *Applied Info. Management, Inc. v. Icart*, 976 F. Supp. 149, 153 (E.D.N.Y. 1977) (stating "As a result of Section 202, a court interpreting a [nonexclusive software] licensing agreement must determine ownership of the copy separately from ownership of the copyright"); PAUL GOLDSTEIN, *COPYRIGHT* § 4.5.1(c) (2d ed. 1996).

10. *Advent Sys., Ltd. v. Unisys Corp.*, 925 F.2d 670, 675 (3d Cir. 1991).

11. 17 U.S.C. § 106 (1994).

12. 17 U.S.C. § 109 (1994).

13. For a detailed discussion of these points, including section-by-section comparison of Article 2 and the Copyright Act, see Lorin Brennan, *Why Article 2 Cannot Apply to Software Transactions*, 38 DUQ. L. REV. (forthcoming 2000).

14. *Little, Brown & Co. v. American Paper Recycling Corp.*, 824 F. Supp. 11 (D. Mass. 1993); NIMMER, *supra* note 6, at section 13.08.

puter information transactions and it does not have the facility to enable the emerging requirements of e-commerce. This is why we need UCITA. UCITA is a new vision specifically drafted for compatibility with the Copyright Act and the emerging requirements of e-commerce.

C. Benefits of UCITA

Like any complex program, UCITA has a rich feature set. Included below are four tables that compare UCITA with current sales law. Table 1 identifies general improvements. Tables 2 and 3 list the benefits for software developers and customers, respectively. Table 4 indicates current rules continued in UCITA. Those interested in further details will find them in the Reporter's Notes¹⁵ or on Carol Kunze's UCITA web site.¹⁶ In broad overview, we can identify four benefits of UCITA: standardization, uniformity, innovation, and modernization.

1. Standardization

The legal standards for information contracting are in disarray. For example, are digital signatures allowed? If so, when and how? Does clicking an "I Agree" icon make an enforceable contract? What about contracts made by electronic agents? What are the rules for digital authentication? What happens in the case of consumer error? Many e-commerce sites merely ask the customer to fill in basic payment information. But this leaves many critical terms up in the air. For example, absent specification, what is the duration of a software license? How many users are permitted? Can the software reside on more than one machine as long as it is not used simultaneously? If copies are ordered, who pays the shipping and insurance costs? What warranties, if any, apply? What are the remedies for breach? Should the law presume that without agreement on these points there is no deal? Or should it provide default rules that apply where the parties have remained silent? UCITA answers these questions.

2. Uniformity

Commercial contract law is made by the states, not the federal government. To ensure national consistency, states pass "uniform laws" so someone in Alabama will be subject to the same rules as someone in Wyoming. Unfortunately, some types of software transactions are still subject to the varying common law of the fifty states. These include development contracts, support and maintenance deals, and on-line access agreements. A dozen states have now enacted different digital signature rules. E-commerce is national and even global. To realize its potential, both suppliers and customers need a single set of uniform rules such as those UCITA provides.

15. Uniform Law Commissioners, *The National Conference of Commissioners on Uniform State Laws* (last modified Dec. 2, 1999) <<http://www.law.upenn.edu/library/ulc/ulc.htm>>.

16. Carol A. Kunze, *The 2BGuide* (last modified Dec. 14, 1999) <<http://www.2bguide.com/>>.

3. Innovation

The law should encourage developers to bring experimental and innovative new products to the public by allowing them to control their risks with proper disclaimers. Two examples are Java and, of course, Linux. Java is a software program developed by Sun Microsystems to run on any platform.¹⁷ Java is used extensively on Web pages to enable animation and graphics. The Software Development Kit can be downloaded for free, subject to Sun's shrink-wrap license¹⁸ which includes a waiver of implied warranties and consequential damages. Both Java and Linux offer a critical trade-off: valuable, free software, but on an "as is" basis. If shrink-wrap and click-on licenses are unenforceable, meaning that the developers must provide non-disclaimable warranties, it is doubtful whether such software would be available for free, if at all. Moreover, if the license is unenforceable, then anyone who downloads (copies) Java or Linux does so without permission, making them copyright infringers. Innovation requires trade-offs between time, cost, and quality. UCITA opts in favor of innovation, letting developers and their customers decide for themselves what those trade-offs should be.

4. Modernization.

Technology has added new ways to make contracts on-line. We need a modern law to support such activity. UCITA is such a law. For example, below are some places where UCITA clarifies and expands customer rights in information transactions.

(a) *Click-on Contracts*: Most e-commerce sites use "click-on" contracts. Current sales law does not have a uniform answer to their enforceability. UCITA allows click-on contracts if specific procedures to ensure informed assent are met.

(b) *Mass Market Concept*: Current law distinguishes between consumer-use and business-use. UCITA instead adopts a "mass market" concept that applies to consumers and businesses alike.

(c) *Expanded Return Rights*: With pre-packaged, mass-marketed software, if the consumer reads the shrink-wrap license and does not like it, he can return the software for a full refund—plus shipping costs. This is more than he would be entitled to under sales law.

(d) *Electronic Agents*: Soon consumers will create their own electronic agents to search the Web and make deals for them. They will have their own "click-on" contracts to propose to vendors. Current sales law will not allow this practice. UCITA does.

17. See Sun Microsystems, Inc., *The Source for Java Technology* (last modified Feb. 10, 2000) <<http://java.sun.com/>>.

18. See Sun Microsystems, Inc., *The Source for Java Technology* (last modified Feb. 10, 2000) <http://java.sun.com/nav/business/source_form.html>.

(e) *On-line Warranty Rights*: Warranty laws, such as the Manguson-Moss Act, only apply to sales of tangible products. Where is the "tangible" product when licensed software is downloaded over the Web? UCITA extends warrantly protection to electronic deliveries.

(f) *New Warranty Rights*: The software business includes system integration contracts, development (service) contracts, and data-processing contracts. UCITA provides new warranties for these types of transactions.

(g) *New Contract Models*: Current sales law does not address support and maintenance contracts, on-line access contracts, and publisher-retailer-customer dealings, to name a few. UCITA does.

(h) *Privacy protection*: What if a vendor uses your private information against your wishes, such as putting your name and address on a mailing list? Does Article 2 allow consumers to make a contract that forces the vendor to take it down? UCITA does.

(i) *Electronic "Time-Bombs"*: Can a vendor use a "time-bomb" that shuts off your software over a minor dispute? UCITA prohibits this practice where there is a risk of personal injury. For businesses, it creates exacting disclosure, notice, and cooling-off periods before "time-bombs" can be used.

Despite these benefits, UCITA is *not* a consumer protection statute. It is a commercial code and thus addresses a larger class of both business and consumer transactions. But UCITA does leave intact all consumer protection laws.¹⁹ The following charts list the various benefits of UCITA over current sales law.

Table 1: General Benefits

General Benefits of UCITA	Article 2	UCITA
Creates uniform information licensing law	No	Yes
Establishes rules for electronic contracting	No	Yes
Establishes rules for electronic signatures	No	Yes
Allows layered contracting over time	No	Yes
Allows contracts with electronic agents	No	Yes
Allows contracts where rights vest before delivery	No	Yes
Establishes new category of mass market	No	Yes
Provides warranties for data processing contracts	No	Yes
Sets standards for providing customer support	No	Yes
Provides rules for outsourcing contracts	No	Yes
Sets standards for on-line access contracts	No	Yes
Extends warranties to electronic deliveries	No	Yes

19. UNIF. COMPUTER INFORMATION TRANSACTIONS ACT, U.L.A. UCITA 1-105(c).

Table 2: Software Licensor Benefits

Software Licensor Benefits in UCITA	Article 2	UCITA
Uniform rules for Internet contracting	No	Yes
Clear procedures for licensing in mass market	No	Yes
Workable choice of law & forum rules	?	Yes
Guidance for attribution of electronic signatures	No	Yes
Guidance for modifying on-going support contracts	?	Yes
Standard interpretations for license terms	No	Yes
Confirms exceeding use restrictions is a breach	?	Yes
Warranty rules for publishing informational content	?	Yes
Clarifies meaning of "personal satisfaction" clauses	?	Yes
Reconciles inspection with confidential information	No	Yes
Clarifies effect of code modifications on warranties	No	Yes
Right to cure deliverables defects if possible	?	Yes
Rules for administering on-line access contracts	No	Yes
Clear procedures for using self-help "time-bombs"	No	Yes

Table 3: Software Customer Benefits

Software Customer Benefits in UCITA	Article 2	UCITA
Cost free refund right in mass market	No	Yes
Consumer defense for electronic error	No	Yes
Procedural safeguards to ensure informed assent	No	Yes
Right of quiet enjoyment (no infringement)	?	Yes
Presumes some licenses perpetual	No	Yes
Presumes early transfer of rights (no infringement)	?	Yes
Implied warranty for system integration	No	Yes
Implied warranty for data accuracy	No	Yes
Codifies advertising can create express warranty	?	Yes
Says publisher's contract does not release retailer	No	Yes
Right to information about incorporated code	No	Yes
Allows specific enforcement of privacy rights	?	Yes
Obligation to cure deliverables defect if possible	No	Yes
Makes licensor agreement not to cancel enforceable	?	Yes
Safeguards on licensor self-help "time bombs"	No	Yes

Table 4: Rules Continued in UCITA

Continuation of Current Rules	Current Law	UCITA
Consumer protection law	Yes	Yes
Unconscionability doctrine	Yes	Yes
Obligation of good faith and fair dealing	Yes	Yes
Defers to federal intellectual property law	Yes	Yes
Express warranty law	Yes	Yes
Implied warranty of merchantability for programs	Yes	Yes
Implied warranty of fitness adapted for programs	Yes	Yes
Requires disclaimers in writing (a record)	Yes	Yes
Enforceability of no oral modification clauses	Yes	Yes
Interpretation of deals by industry standards	Yes	Yes
Right to adequate assurances of performance	Yes	Yes
Risk of loss in delivery of copies	Yes	Yes
Interpretation of delivery terms	Yes	Yes

These are the benefits of UCITA over current law. But this is not the end of the story. New and even better possibilities are already appearing on the horizon.

III. "BUT IT MOVES"—E-CONTRACTING COMETH

When the Inquisitors demanded that Galileo renounce his claim that moons were in fact revolving around Jupiter, he uttered his immortal retort: *eppur si moue*—"but it moves." His point was that when the facts contradict our fixed ideas, it is our ideas that must change. We have already discussed how the fixed idea of a software transaction as no more than a "sale of goods" is inadequate. But the possibilities for e-contracting events now emerging on the Web require even more dramatic rethinking of old ideas.

A. Bots Revisited

The previous installment of this Article introduced bots. To repeat, a *bot* is a software program that traverses the web's hypertext structure by retrieving a document and, recursively, all documents referenced in it.²⁰ Normal web browsers are not bots because they are operated by a human being. The term *bot* has become a common synonym for *electronic agent*, despite certain technical differences.²¹ Some examples of bots are:

20. Martijn Koster, *The Web Robots FAQ* (visited April 10, 2000) <<http://info.webcrawler.com/mak/projects/robots/faq.html>>.

21. See RICHARD MURCH & TONY JOHNSON, *INTELLIGENT SOFTWARE AGENTS* (1999) ["MURCH & JOHNSON"].

- (a) Chatterbots—used for chatting on the Web.
- (b) Searchbots—general agents used for searching.
- (c) Spiderbots—agents that crawl from site to site searching for new Web content; they are used by the major search engines, such as Lycos and Infoseek.
- (d) Newsbots—look for news.
- (e) Knowbots—short for “knowledgebots,” seek out specific knowledge.
- (f) Shoppingbots—help find deals on-line.
- (g) Sexbots—well, you guessed it.

The number of Web sites devoted to bot information has grown spectacularly. The BotSpot®, “The Spot for All Bots on the Net”²² still remains the classic starting point. Several other sites are listed in the sidebar on the next page.

B. Next Generation Bots

Bots are evolving. The latest developments include “autonomous agents” which travel between Web sites using their own selection criteria, and “intelligent agents,” which are programs that help users to perform specific acts, such as selection, form filling, or site location.²³

An influential AI textbook says:

[a]n agent is anything that can be viewed as perceiving its environment through sensors and acting on its environment through effectors. A human agent has eyes, ears and other organs for sensors, and hands, legs, mouth and other body parts for effectors A software agent has encoded bit strings as its precepts and actions.²⁴

In the view of these writers, an intelligent agent, or *ideal rational agent*, is one that does “whatever action is expected to maximize its performance measure, on the basis of the evidence provided by the precept sequence and whatever built-in knowledge the agent has.”²⁵ IBM offers the following definition: “Intelligent agents are software agents that carry out some set of operations on behalf of a user or another program with some degree of independence or autonomy and, in so doing, employ some knowledge or representation of the user’s goals or desires.”²⁶

22. BotSpot (visited April 10, 2000) <<http://www.botspot.com/>>.

23. MURCH & JOHNSON, *supra* note 21, at 46-47.

24. STUART J. RUSSELL & PETER NORVIG, *ARTIFICIAL INTELLIGENCE: A MODERN APPROACH* 31 (1995).

25. *Id.* at 33.

26. MURCH & JOHNSON, *supra* note 21, at 10.

Agent Sites to Explore

(Visited 9/29/99)

The BotSpot®
<http://www.botspot.com/>
AgentBuilder®
<http://www.AgentBuilder.com/>
MarketMaker (MIT)
<http://ecommerce.media.mit.edu/>
Frictionless Commerce, Inc.
<http://www.frictionless.com/>
**Foundation for Intelligent
Physical Agents**
<http://www.fipa.org/>
**Agent Mediated E-Commerce
Initiative (MIT)**
<http://ecommerce.media.mit.edu/>
Multi-Agent Systems
Laboratory (U. of Mass)
<http://mas.cs.umass.edu/index.shtml>
**IBM Institute for Advanced
Commerce**
<http://www.ibm.com/iac/>
JATLite (Stanford)
<http://java.stanford.edu/>
AgentLink (Europe)
<http://www.agentlink.org/>
**INT'L. ASSN. FOR ARTIFICIAL
INTELLIGENCE & LAW**
<http://nathan.gmd.de/iaail/iaail.html>
Cyber Settle
<http://www.cybersettle.com/>

The goal, of course, is not just to define such electronic agents but to build them. The reasons are pressing. Agents that merely traverse the Internet and send back information recursively, downloading every link encountered, generate an increasing amount of network traffic. What is needed instead are self-directed agents that can move from site to site and process an interaction locally. The mantra is that: move the computations to the data rather than the data to the computations.²⁷ This new breed of electronic agents will need the following attributes:

- (a) *autonomy*—the agent senses and reacts to the environment on its own agenda, not tied to the central server;
- (b) *intelligence*—in the sense that it employs knowledge and automated reasoning methods to respond to a set of goals; and
- (c) *mobility*—meaning that it can move freely through the environment based on internally generated decisions about where to find data and information.

The entities researching and developing mobile, autonomous, intelligent electronic agents are increasing at a stunning rate. AgentBuilder®, a company that provides tools for building electronic agents, has an extensive list of commercial

27. *Id.* at 101.

products and academic research papers listed on its site.²⁸ The Agent Society, a new professional organization for those interested in e-agents, lists the following categories of "Agents and Application Taxonomies" under development.²⁹

Mobile agents	Process/workflow control agents
Stationary agents	Operational support agents
Intelligent agents	Personal assistant agents
Autonomous agents	Service integration agents
Profile agents	Multi-agents
Community of interest agents	Simulator agents
Cooperating agents	Planning and resource allocation agents
Finding, gathering and filtering agents	Agent toolkits
Electronic commerce agents	

What does this mean for consumers? In the very near future, software programs—intelligent, mobile agents—will be available to traverse the web on the consumer's behalf. The agents will not only be able to identify desirable sites, they will be able to conduct an interaction at the site, extracting information that meets the consumer's individually selected criteria. Think about the current sites on the Web for buying a car or airline tickets. Now consumers have to visit those sites directly to find what they want. Soon consumers will have their own electronic agents—bots—that can visit those sites for them and identify the best offerings.

Better than that, the agents can even negotiate the deal. To see what this really means, the site to visit is Market Maker at the MIT Media Lab site.³⁰ The previous version of this Article discussed the developments at the Media Lab and the plans for Market Maker (called Kasbah in an earlier version). It is now up and running. Market Maker allows buyers or sellers to encapsulate their desires in an electronic agent, give it a dealing strategy, and send it into an electronic marketplace of other agents to make deals. Turn your web-scope there and try it.

C. Bargaining Protocols

Of course, we must design the rules under which agents can come to agreement for automated contracting to operate effectively. Professors Jeffrey Rosenschein of Hebrew University and Gilad Zlotkin of MIT have recently published a study that uses a combination of distributed AI and game theory to do just that.³¹

Their approach distinguishes a *protocol* and a *strategy*. A *protocol* refers to "the public rules by which agents . . . come to agreements."³² In legal terms, a protocol would mean the rules for contract formation in UCITA. A *strategy* is

28. See Agent Builder, *Agent Construction Tools* (last modified Feb. 1, 2000) <<http://www.agentbuilder.com/agenttools/index.html>>.

29. Agent Society, *Agent Society Home Page*, (visited April 10, 2000) <<http://www.agent.org/>>.

30. David Wang, *Market Maker* (visited April 10, 2000) <<http://ecommerce.media.mit.edu/maker/maker.htm>>.

31. JEFFREY S. ROSENSCHEIN & GILAD ZLOTKIN, RULES OF ENCOUNTER: DESIGNING CONVENTIONS FOR AUTOMATED NEGOTIATIONS AMONG COMPUTERS (1994) ["ROSENSCHEIN & ZLOTKIN"]

32. *Id.* at 3.

the private way an agent elects to behave in a particular interaction using the protocol. For example, a strategy might involve expressly stating that there is no agreement until all terms are agreed upon, rather than allowing agreement only on essential terms. Ideally, the protocol should have, among others, the following attributes: (1) *efficiency*, meaning the system does not encourage agreements that squander resources; (2) *fairness*, meaning the system does not arbitrarily discriminate against any particular type of agent; and (3) *transparency*, meaning the system encourages strategies that do not rely on deception or duplicity.

Let me give two examples of how this will work. The first, drawn from the work of Professors Rosenschein and Zlotkin, deals with what we can call "long distance bargaining."³³ Instead of signing up a telephone company as a fixed long distance carrier, imagine instead a system for automated negotiation. Each caller has an electronic agent attached to the telephone line. When the caller places a call, the carrier responds with a price quote for that call at that moment. There is no fixed rate. On-time pricing could be determined by a number of factors. AT&T's server is overloaded; MCI has excess capacity; Sprint is offering a special rate. Maybe the call is for data transmission and the user wants better line quality, albeit for a higher price. Regardless of the circumstances, negotiation occurs for the price for *this call right now*.

What is the *protocol* under which the bidding should occur? One possibility would be that the lowest bid wins. However, this leads to suboptimal results. While no company has an incentive to bid a price lower than its true cost, there is an incentive to bid high. Is there a bidding protocol that encourages phone companies to bid their true cost? "The answer is a qualified yes."³⁴ It is called Vickrey's Mechanism. Basically, it says that the lowest bid wins, but the price paid by the user is the second lowest rate. This situation encourages phone companies to bid accurately. A bid too low might mean the company wins but could have to provide the service at below its cost. A bid too high might mean the company does not get the contract. While it may cost slightly more, the consumer will still benefit from accurate bids. "By separating the issues of who wins the bid, and how much the winner gets, we've fundamentally altered the way in which computers should play the game."³⁵

D. Settlement Games

Now let's move into high-gear with an example that may be more immediately meaningful to lawyers. Turn your Web-scope to cyberSettle.³⁶ This is a web site that allows parties to engage in automated settlement negotiations on line. According to the site, the negotiations occur as follows:³⁷

33. *Id.* at 9-12.

34. *Id.* at 12.

35. *Id.*

36. *cybersettle* (visited March 26, 2000) <<http://www.cybersettle.com/>>.

37. *cybersettle* (visited March 26, 2000) <<http://www.cybersettle.com/how/index.htm>>.

- (a) Sponsor or claimant submits three settlement offers or demands for each claim via the Internet into cyber\$ettle's secure website.
- (b) cyber\$ettle then advises that the case is online and available for settlement.
- (c) Each party has three opportunities (rounds) to settle. One demand or offer is entered for each round.
- (d) cyber\$ettle instantly compares each demand to the settlement offer and notifies the parties of a settlement on screen. A written confirmation follows.
- (e) Currently participants are utilizing the following formula:
 1. If the offer or demand is within 30%, or \$5000, of the demand, the claim is settled for the median amount.
 2. If the offer or demand differs by more than 30%, or \$5000, in all three rounds, the claim will not settle.
 3. If the settlement offer is the same or greater than the claimant's demand, the claim is settled for the demand amount.

Cyber\$ettle gives the following illustration:

cyber\$ettle Illustration 1: Offer is within 30% of Demand

Round	Settlement Offer	Demand	Results
1	\$20,000	\$50,000	No settlement
2	\$25,000	\$45,000	No settlement
3	\$30,000	\$40,000	Settled for \$35,000

Cyber\$ettle does not reveal any offer or demand; only the settlement amount is revealed. This is certainly an innovative approach and one which allows parties a unique and effective means to settle disputes. But let's ask a different question: can we automate it?

The cyber\$ettle approach could be modeled as a finite, two person, non-cooperative game of imperfect information.³⁸ In fact, the underlying model would be the well-known game of "chicken." Notice that in cyber\$ettle parties only have

38. A full discussion of game theory is beyond this Article. Interested parties should see DOUGLAS G. BAIRD, ROBERT H. GERTNER & RANDAL C. PICKER, *GAME THEORY AND THE LAW* (1994).

three chances to make settlement offers. Obviously, if there is a desire to settle, a participant may adjust a later settlement offer if the first was not accepted. But there is no requirement to do so. In fact, one strategy may be never to change a settlement offer at all, on the theory—or hope—that the other party will cave in. Of course, if both parties adopt this strategy, there will never be a settlement. This is why the game of chicken has no optimal solution, or what are called “pure” strategies—*i.e.*, the game can only be played a fixed number of times. Another illustration is labor negotiations, which follow a similar game form and in which parties are prohibited from making inflexible offers.³⁹

Now what would happen if we were to encapsulate the settlement offers into electronic agents? These electronic agents make an iterated series of far more than three offers in a very short time. Allowing the game to be played many times changes the game dynamic to one of “mixed” strategies. In that case, as John Nash showed, there will be an “equilibrium point.”⁴⁰ In other words, we can devise a bargaining strategy for both electronic agents that will yield an “optimal” result, meaning that, if we assume both parties act rationally, *neither* party can do better by pursuing any other strategy. Professors Rosenschein and Zlotkin discuss at length such a strategy, called the Extended Zeuthen Strategy, although not in the context of cyber\$ettle. The details are beyond the scope of this Article. The point, however, is that by using electronic agents parties can engage in more effective bargaining and in ways not previously possible. And they can do so in ways that yield the optimal result for everyone involved. The implications for legal theories of contracting and bargaining are profound.

E. New E-contracting

This move to electronic, automated bargaining demonstrates three fundamental changes from prior contracting models.

1. *Parties.* The parties will not be set in rigid roles of “seller” and “buyer,” or “licensor” and “licensee.” Consumers will be as much creators and suppliers of information as will be companies. Roles will be flexible, with parties capable of dynamically adopting multiple roles as provider or recipient in any transaction.

2. *Methods.* Negotiation need not occur in the expensive, inefficient, face-to-face bargaining methods of the past. Instead, negotiation can happen electronically through the medium of electronic agents *and standard forms*. UCITA-102(a)(66) defines a “standard form” as “a record or a group of related records containing terms prepared for repeated use in transactions and so used in a transaction in which there was no negotiation by individuals except to set the price, quantity, method of payment, selection among standard options, or time or method of delivery.”⁴¹ Most of the complaints have been about the use of

39. *Id.*

40. ROSENSCHEIN & ZLOTKIN, *supra* note 31, at 48.

41. UNIF. COMPUTER INFORMATION TRANSACTIONS ACT, U.L.A. UCITA section 102(a)(66).

shrinkwraps and other “standard forms.” But notice that electronic agents will have to negotiate using standardized protocols that will operate as UCITA standard forms. This standardization allows the development of methods with provable efficiency, transparency and fairness.

3. *Structure.* The structure of the negotiating protocols and the available bargaining strategies will be not be based on *ad hoc* rules, but instead on a solid mathematical foundation using game theory and distributed AI that will allow for maximum utility for all parties.

IV. CONCLUSION

Here then, is the meaning of UCITA: a new world view. The old, contracting world view sees everything revolving around the Holmesian notion of “merchant bargaining,” of two parties sitting around a table, face-to-face, haggling out a contract term by term. Their lawyers sit at their elbows, quill pens and parchment aquiver, duly documenting the “mutual assent.” There is nothing wrong with this approach in its proper place, and it certainly places lawyers in a flattering role. But it is not the only possibility.

The world of automated, on-line contracting offers another vision, one that includes the old model but expands far beyond it. It is not about protectionism but empowerment, not about regulation and restraint but about authorization and party autonomy. In a word, it is about freedom of contract. This is the world view of UCITA.

What, in the end, was the crime of Galileo? That he dared look through the telescope and herald a Renaissance.