

CONTRACT FORMATION IN THE AGE OF AUTOMATION: A STUDY OF THE ATTRIBUTION RULES IN ELECTRONIC COMMERCE LEGISLATION

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1. Introduction

Like it or not, the old road is rapidly aging. As commercial transactions veer off traditional paths and swerve onto the information superhighway, the cornerstone of traditional common law contract theory - the notion of *consensus ad idem* - will suffer further erosion. Soon, it will be disingenuous to characterize many online transactions as giving rise to contracts in the traditional sense - namely, a “jural relation that is founded upon agreement.”¹ As enterprise migrates further into electronic environments, commercial transactions will no longer be entered into and carried out exclusively by humans. Many such transactions will be initiated and completed by computer software programs. These automated transactions will not easily fit within the traditional paradigm of contract doctrine. They will not be the “manifestation of a mutual concordance between [two] parties as to the existence, nature and scope of their rights and duties.”²

In fact, the entire point of developing a technology that automates electronic commerce is to allow transactions to take place without any need for human traders to review or even be aware of particular transactions.³ This

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1. See G.H.L. Fridman, *The Law of Contract*, 3rd ed. (Scarborough: Carswell, 1994) at 5.

2. *Ibid.*

3. See e.g. P. Maes, “Agents that Reduce Work and Information Overload” (1994) 37:7 *Communications of the ACM* 30; B. Hermans, *Intelligent Software Agents on the Internet: An Inventory of Currently Offered Functionality in the Information Society and a Prediction of (Near-)Future Developments* (Ph.D. Thesis, Tilburg University 1996) (1997) 2:3 *First Monday*, online: *First Monday* <http://www.firstmonday.dk/issues/issue2_3/index.html> (last modified: 11 December 1998).

is not small change. Unlike the current technology utilized in vending machines and mechanical parking attendants, the software that automates electronic commerce will not simply provide a predetermined extension of human interaction. If the technology lives up to the promise of its creators,⁴ if the software is truly able to transact autonomously, its operations will be more accurately characterized as that of a commercial intermediary than a mechanical instrument.

How the law responds to such innovation will have an important effect on the future development and growth of electronic commerce. In order to fully enjoy the benefits of automation, human and corporate traders need to be confident that the transactions generated by and through their computers are legally enforceable. This need notwithstanding, it is quite clear that the use of computer software to automate the contract formation process, especially in an online environment, generates considerable doctrinal difficulties.⁵ The aim of this article is to provide an in-depth analysis of the contract formation issues peculiar to automated electronic commerce.

2. Contracts Made Through Machines

The idea of an automated transaction is not a novelty.⁶ Some students of the common law will recall the classic decision of Denning M.R. in *Thornton v. Shoelane Parking Ltd.*⁷ The issue in that case was whether an exclusion clause found on the back of a ticket issued by a machine in a parking lot could be incorporated as a condition of the contract to park in the garage. Lord Denning went to some lengths to distinguish the case at bar from the “ticket cases of former times.”⁸ The old ticket cases, he said, were based on the theory that the customer, on being handed the ticket, could refuse it and decline to enter into a contract on those terms. In former times, if the customer did not like the terms and conditions printed on the back of the ticket, he or she would simply ask the parking lot attendant for a refund. But, as Denning M.R. pointed out, no such option exists for a customer who has no choice but to transact through a machine:

4. See e.g. J. Liu and N. Zhong, *Intelligent Agent Technology* (Singapore: World Scientific, 1999).

5. See e.g. L. Davies, “Contract Formation on the Internet: Shattering a Few Myths” in L. Edwards & C. Waelde, eds., *Law & The Internet* (Oxford: Oxford-Hart Publishing, 1997) 97; T. Allen & R. Widdison, “Can Computers Make Contracts?”(1996) 9 *Harv. J. Law & Tech.* 25; C. Karnow, “Liability For Distributed Artificial Intelligences”(1996) 11 *Berkeley Tech. L. J.* 147.

6. See e.g. L. Wein, “The Responsibility of Intelligent Artifacts: Toward an Automation Jurisprudence”(1992) 6 *Harv. J. L. & Tech.* 103.

7. [1971] 1 All E.R. 686 (C.A.).

8. *Ibid.* at 689 (emphasis added).

The customer pays his money and gets a ticket. He cannot refuse it. He cannot get his money back. He may protest to the machine, even swear at it; but it will remain unmoved. He is committed at the very moment when he puts the money into the machine. The contract was concluded at that time.⁹

As Denning M.R. observed, automated transactions such as the one involving Mr. Thornton in the parking garage can be analysed and understood as a simple unilateral contract.

The offer is made when the proprietor of the machine holds it out as being ready to receive the money. The acceptance takes place when the customer puts his money into the slot. The terms of the offer are contained in the notice placed on or near the machine stating what is offered for the money. The customer is bound by those terms, as long as they are sufficiently brought to his attention beforehand, but not otherwise.¹⁰

Automated transactions such as the one described by Denning M.R. are best understood as contracts made *through* a machine. From the perspective of contractual analysis, the critical point to recognize is that the machine is neither an offeror nor an offeree. The machine is merely the conduit through which some *person's* offer is promulgated (and through which another person's acceptance is communicated and their performance is tendered). In fact, it is the inability of the machine to respond to anything other than the programmed transaction which gives rise to the issue in *Thornton v. Shoelane Parking*. Because the machine in question functioned as nothing more than an extension of one person's intent to transact in a particular, predetermined way, the unilateral offer analysis put forth is a sufficient explanatory account of the automated transaction. As Denning M.R. put it, the offer is made by the proprietor of the machine when she or he holds that machine out as being ready to receive the money in exchange for the promised goods or services.

What about situations where the automation process is not predetermined by the proprietor of the machine? For example, what happens when computer software programs contract behind our backs? Although this sounds like a strange question to ask, we live in strange times.

9. *Ibid.*

10. *Ibid.*

3. Intelligent Agent Technology

3.1 *What is Intelligent Agent Technology?*

An entire industry, known as *intelligent agent technology*, capitalizes on the desire of consumers and merchants to automate online transactions. Intelligent agent technology has numerous applications both in and outside of electronic commerce.¹¹ The current generation of e-commerce agent applications is focused on reducing transaction costs. The aim is to eliminate various time-consuming activities that form part of an online transaction, such as: investigating the reliability of new brands, searching for the best available price, appraising product performance, determining the speed of product delivery, etc. As will be described in Part 3.2 below, agent technology can be used to conduct a variety of sophisticated online searches. But, the true promise of agent technology extends far beyond this. Perhaps, the most innovative application is one which makes it possible for intelligent agents to interact, exchange information and engage in operations that, from all outward appearances, look very much like the negotiation and creation of contractual agreements.¹²

It is difficult for those who have neither seen nor used agent technology to fully imagine its potential. In essence, what distinguishes intelligent agent applications from other computer assisted activities is that agent technology promises to perform various complex tasks *autonomously* - i.e., without human oversight or intervention. Consider the following futuristic example. An agent application is designed for a notebook computer manufacturer. The system design supports a team of intelligent software agents, each of which is dispatched to perform some particular task in conjunction with the tasks performed by other agents on the team. For example, after an agent designated to monitor the database that keeps track of the current supply of DVD players (needed for the production of the notebooks) discovers that the supply is becoming low, it launches into action several merchant brokering

11. Other commercial and industrial applications include: information management, business process management, healthcare management, patient monitoring, gaming technologies, interactive theatre, product manufacturing, air traffic control, etc. See Jennings & Wooldridge, "Applications of Intelligent Agents" in *Agent Technology* (Heidelberg: Springer-Verlag, 1998) 3 and Hermans, *supra* note 3.

12. See e.g. A. Chavez et al., "A Real-Life Experiment in Creating an Agent Marketplace" (Proceedings of the Second International Conference on the Practical Application of Intelligent Agents and Multi-Agent Technology (PAAM'97), London, UK, April 1997), online: MIT Media Laboratory <<http://ecommerce.media.mit.edu/papers/paam97.pdf>> (last modified: 25 January 2000).

agents, which are then dispatched to search various Internet sites that specialize in wholesale computer parts, in order to find the best price available. Once the appropriate Internet sites have been discovered and evaluated, other electronic agents step in to negotiate the terms and conditions upon which a particular order of DVD players might be purchased (including product warranties, freight rates, delivery dates, exemption clauses, etc.). Other agents assist with the information and communications pertaining to placing orders and arrange the shipping and receiving of the DVD players, while a different electronic agent initiates an electronic payment scheme. Still other software agents deal with the marketing and sales of the notebook computers, which is to commence once the DVD players have been installed and the manufacturing process is complete.

Computer scientists believe that intelligent agent architectures will soon make it possible to automate entire processes such as the one imagined above. These processes will no longer require human oversight or intervention. Though perhaps more sophisticated, the futuristic agent system imagined above is not unlike the information systems that currently control complex patterns of air traffic in a modern airport. In both systems, the process of automation is meant to remove human choice from a complex series of information exchanges.¹³

In order to do so, the intelligent software agents used in those systems must have the following additional properties:¹⁴

- *social ability* (the capacity to interact with other software agents or with human beings through a shared language)

- *mobility* (*the ability to move around an electronic environment*)

13. Although the automation process (so long as it works) might be uncontroversial in the context of mundane information transactions such as scheduling the landing priority of a series of airplanes, automation becomes controversial when the automated transactions concern contractual promises that have the legal effect of limiting someone's future freedom of action. It is a strange world in which a computer program is able to alter the legal position of a person by negotiating and entering into an agreement without that person's knowledge or consent. These difficulties will be dealt with below in Parts 5 & 6.

14. See *e.g.* Hermans, *supra* note 3; Jennings & Wooldridge, *supra* note 11 at 4-5; M.R. Genesereth & S.P. Ketchpel, "Software Agents" (1994) 37:7 Communications of the ACM 48; J.E. White, "Mobile Agents White Paper" (1997-1998), online: General Magic <<http://www.genmagic.com/technology/techwhitepaper.html>> (last modified: 18 September 1998); J.S. Rosenschein & M.R. Genesereth, "Deals Among Rational Agents" in A.K. Joshi, ed., IJCAI 1985: *Proceedings of the Ninth International Joint Conference on Artificial Intelligence, Los Angeles, CA* (Morgan Kaufmann, 1985).

- ***temporal continuity*** (the ability to run a process continuously in an active or passive mode rather than merely performing a once-only computation)
- ***reactivity*** (the ability to perceive an environment and respond to changes that occur within it)
- ***proactivity*** (the ability to initiate goal-directed behaviour)
- ***goal orientedness*** (*the ability to handle complex, high level tasks by performing operations that break down tasks into smaller sub-tasks and then prioritize the order in which these tasks will be accomplished*)
- ***adaptivity*** (*the ability to adjust to the habits, working methods and preferences of a user*)

One of the early prototypes developed at the MIT Media Lab that exemplifies a number of the above properties was a software program called Maxim.¹⁵ Described as a “personal digital assistant”, this software exploits agent technology, in order to manage and filter email. The program can “learn to prioritize, delete, forward, sort, and archive mail messages, on behalf of a user” by “looking over the shoulder”¹⁶ of a user, as he or she works with his or her email and by making internal predictions about what a user will do with the email. Once Maxim achieves a particular level of accuracy in its predictions, it commences to offer suggestions to the user about how best to handle the email.

Around the same time that Maxim was being developed, Maes et al. also designed an Internet news filtering program known as Newt. After a human user provides Newt with a series of examples of news articles that would and would not be of interest, this information-specific feedback is utilized by Newt to develop an internal model of the user’s preferences, which is ultimately employed by Newt to filter and thereby select those items of news that would be of interest, without any need for the human user to browse the items. Newt is also capable of retrieving articles, on the basis of explicit rules, as provided by the user.¹⁷ More recent developments at the MIT Media

15. Maes, *supra* note 3.

16. *Ibid.* at 35.

17. *Ibid.*

Lab and elsewhere have shifted away from automating pure information management systems, in favour of agent technology aimed specifically at furthering electronic commerce.

3.2 *Recent Applications of Intelligent Agents in Electronic Commerce*

Although the catalogue of current agent applications is far too extensive to enumerate, it is useful to provide a few examples as illustrations. One application which aims to assist consumers in product brokering (ie., in determining what to buy) is PersonaLogic.¹⁸ PersonaLogic facilitates transactions, by guiding consumers through a large product feature space. This is accomplished by allowing consumers to specify constraints on a product's features. A constraint satisfaction search engine then returns an ordered list of only those products that satisfy all the consumer's chosen preferences.

Other shopping agents have been developed that make comparisons, not on the basis of products, but by comparing merchant alternatives (merchant brokering). The first agent of this kind, developed by Andersen Consulting, is known as BargainFinder.¹⁹ When a user provides the name of a particular product, e.g., a DVD containing the Talking Heads concert film: Stop Making Sense, BargainFinder is able to search a number of merchant Web sites to determine and compare various price differentials. More recent applications, such as Jango,²⁰ have been developed, in order to correct certain limitations found in the earlier versions of merchant brokering agents.²¹ Other agents exploit different mechanisms for merchant brokering. Instead of surfing the Web for the best advertised prices, the University of Michigan's AuctionBot allows buyers and sellers to congregate in a known meeting place and participate in personalized auctions that are created by sellers who are allowed to specify parameters such as clearing times, methods for resolving bidding ties, etc.²² One of the features said to distinguish AuctionBot from

18. PersonaLogic URL: <<http://www.personalogic.com/>>.

19. BargainFinder URL: <<http://bf.cstar.ac.com/bf/>>.

20. Jango URL: <<http://www.jango.com/>>.

21. See R. Doorenbos, O. Etzioni & D. Weld, "A Scalable Comparison-Shopping Agent for the World Wide Web" in Agents 1997: Proceedings of the First International Conference on Autonomous Agents, Marina Del Rey, C.A. (New York: ACM Press, 1997).

22. AuctionBot URL: <<http://auction.eecs.umich.edu/>>. See also P.R. Wurman, M.P. Wellman & W.E. Walsh, "The Michigan Internet AuctionBot: A Configurable Auction Server for Human and Software Agents" in K.P. Sycara, M. Wooldridge eds., *Proceedings of the Second International Conference on Autonomous Agents, St. Paul- Minneapolis, USA* (New York: ACM Press, 1998), online: Association for Computing <<http://www.acm.org/pubs/citations/proceedings/ai/280765/p301-wurman/>> (last modified: 29 June 1999).

a number of other auction sites is that it provides an “application programmable interface” that enables users to create their own software agents to autonomously compete in the AuctionBot marketplace.²³ By virtue of this feature, human users need not invest time in the actual bidding process, which often lasts for several hours or, in some cases, several days. Similar features can be found on other popular auction sites, such as eBay.²⁴

One of the more promising recent developments in agent technology related to merchant brokering and negotiation is MIT Media Lab’s Tete-a-Tete (T@T).²⁵ The feature that distinguishes this technology from many of its predecessors, including the auction bots, is that T@T agents negotiate in a cooperative rather than competitive style.²⁶ T@T agents also negotiate across multiple terms of a transaction including “warranties, delivery times, service contracts, return policies, loan options, gift services, and other merchant value-added services.”²⁷ Another MIT Media Lab agent application is known as Kasbah. Though it cannot negotiate across multiple terms of a transaction like T@T, the kind of transactions that can be achieved through Kasbah are also quite promising. With Kasbah, “a user wanting to buy or sell goods creates an agent, gives it some strategic direction, and sends it off into a centralized agent marketplace. Kasbah agents proactively seek out potential buyers or sellers and negotiate with them on behalf of their owners. Each agent’s goal is to complete an acceptable deal, subject to a set of user-specified constraints such as a desired price, a highest (or lowest) acceptable price, and the date by which to complete the transaction.”²⁸

23. See R. Guttman, A.G. Moukas & P. Maes, “Agent-Mediated Electronic Commerce: A Survey” (1998) 13 *The Knowledge Engineering Review* 147, online: MIT Media Laboratory <<http://ecommerce.media.mit.edu/papers/ker98.pdf>> (last modified: 25 January 2000) at 3.

24. eBay URL: <<http://www.ebay.com/>> (last modified 3 April 2000).

25. T@T URL: <<http://ecommerce.media.mit.edu/tete-a-tete/>>. The T@T architecture has recently been sold to Frictionless Commerce, Inc., who is actively commercializing the value-based comparison shopping technologies behind T@T. See <<http://www.frictionless.com/>> (last modified: 19 February 2000).

26. Like Kasbah, described above, this negotiation takes the form of multi-agent, bilateral bargaining. But, instead of using simple raise or decay functions, Tete-a-Tete follows what has been characterized as an “argumentative” style of negotiations. See e.g. S. Parsons, C. Sierra & N.R. Jennings, “Agents that Reason and Negotiate by Arguing” (1998) 8 *Journal of Logic and Computation* 261.

27 R. Guttman & P. Maes, “Agent-Mediated Integrative Negotiation for Retail Electronic Commerce”(Proceedings of the Workshop on Agent Mediated Electronic Trading (AMET’98), Minneapolis, Minnesota, May, 1998), online: MIT Media Laboratory <<http://ecommerce.media.mit.edu/papers/amet98.pdf>> (last modified: 25 January 2000).

28. See Guttman et al., *supra* note 23 at 3,4.

It must be understood and underscored that the kind of negotiations that T@T and Kasbah agents are presently capable of are still quite primitive. For example, Kasbah agents operate within a closed system. Unlike the futuristic example described above in Part 3.1 (where it is imagined that agents are able to roam the World Wide Web and make deals with foreign agents encountered along the way), Kasbah agents are incapable of interacting with agents outside of Kasbah's local environment. Consequently, anyone who wishes to buy goods from a person using a Kasbah agent must also create a Kasbah agent. Although this limits the scope of agent transactions to local rather than global interactions, it does allow Kasbah to be a legally regulated environment. By virtue of its closed environment, the agreements generated by Kasbah agents are legally binding. Because sellers and buyers must come to Kasbah, the transaction protocols can be set up in such a way that one is unable to create a Kasbah agent without first agreeing to adhere to certain rules of engagement.²⁹ Only after one expressly agrees to be bound by the Kasbah agent does the system allow that agent to be programmed to carry out a particular negotiation strategy. Only after the agent's negotiation strategy has been expressly authorized by the user is the Kasbah agent then sent off to a centralized, virtual marketplace where other Kasbah agents are able to interact with it in a predetermined way.

From the perspective of contract doctrine, Kasbah's closed system is unproblematic. Because the person utilizing a Kasbah agent has predetermined the parameters of its negotiation strategy³⁰ and has agreed in advance to be bound by it, all Kasbah-generated agreements are legally enforceable. In essence, the contracts generated by closed agent systems such as Kasbah can be understood in precisely the same way as contracts made through more primitive machines like the parking attendant in *Thornton v. Shoelane Parking*.³¹ The offer is made when the seller's automated agent holds itself out as being authorized to complete the transaction on the terms as specified. Acceptance takes place when the buyer clicks on a mouse or otherwise intimates a willingness to be bound in accordance with the specified terms. In the case of Kasbah, where electronic agents operate on both sides of the transaction, the contract must be "physically consummated" by the human

29. Entering into such an agreement is a precondition to entering the Kasbah system.

30. The software is not sufficiently autonomous to make determinations as to a particular user's preferences. Consequently, the user must program the upper and lower limits of what he or she is willing to offer or accept.

31. *Supra* at note 7.

users, since an electronic agent cannot always tender performance in the way that an automated parking attendant can.³²

3.3 *The Future of Intelligent Agents in Electronic Commerce*

The future is full of question marks. Whether intelligent agents will appear in electronic commerce as part of an evolutionary or revolutionary process is, as yet, unknown.³³ As some scholars have pointed out,³⁴ much will depend on the future infrastructure and architecture of the Internet. Important choices lie ahead. For example, what will be the appropriate agent standards?³⁵ Will a homogeneous³⁶ or heterogeneous³⁷ architecture be adopted? Will some sort of interoperability standards be required?³⁸

The extent to which agent technology will require an interoperability standard exemplifies one of the many difficult choices faced by developers of agent technology. Currently, there is much debate over the appropriate agent paradigm in electronic commerce. Specifically, should its negotiation protocol be competitive or cooperative in nature?³⁹ Guttman et al. have recently rebuffed the use of competitive protocols in retail markets from economic, game theoretic, and business perspectives.⁴⁰ Since merchants tend to strive for highly cooperative, long-term relationships with their customers, in order to maximize loyalty, customer satisfaction and reputation, Guttman et al. recommend more cooperative multi-agent decision analysis tools instead of competitive negotiation

32. For example, if the Kasbah agent is selling videos of Neil Peart's latest drumming clinic, the human seller will have to physically ship the videos to the buyer, etc.

33. See Hermans, *supra* note 3 at c.6.

34. *Supra* note 3.

35. E.g. will *Agent Communication Language* [ACL] used in conjunction with *Knowledge Interchange Format* [KIF] and *Knowledge Query and Manipulation Language* [KQML] remain the standard?

36. I.e. a single, all-encompassing system which handles all transactions and functions.

37. I.e. a series of separate systems within which certain kinds of agents interact with other agents of the same kind.

38. I.e. a standard that enables an intelligent agent to engage in cooperative activities with other agents, such as information searches.

39. See, generally, J.S. Rosenschein & G. Zlotkin, *Rules of Encounter: Designing Conventions for Automated Negotiation Among Computers* (Cambridge, Mass.: MIT Press, 1994).

40. R. Guttman & P. Maes, "Cooperative vs. Competitive Multi-Agent Negotiations in Retail Electronic Commerce" in M. Klusch & G. Weib, eds., *CIA 1998: Cooperative Information Agents II, Paris, France* (Springer, 1998), online: MIT Media Laboratory <<http://ecommerce.media.mit.edu/papers/cia98.pdf>> (last modified: 25 January 2000).

protocols, such as online auctions. If this approach becomes the norm - which presently seems to be the case - an interoperability standard will indeed be necessary.

If it does turn out that open standards are further developed and adopted, one might expect that electronic commerce will shift from its local mode of interaction. No longer will transactions take place within closed systems, such as MIT's Kasbah.⁴¹ Likely, there will be a move towards 'public' systems; agents will roam the Net in search of transactions partners. This will require much greater agent mobility than the current technology permits.⁴² In the open marketplaces of the future, the specific negotiation protocols will likely not be wholly predetermined. These negotiation protocols would be left to the predilections of those who design, create and employ the intelligent agents involved in particular transactions and, eventually, to the intelligent agents themselves.⁴³

The future shift toward open systems will have a significant impact on the legal treatment of automated electronic commerce. The current closed systems have the commercial advantage of clarifying all of the legal rules in advance. Recall, for example, that the gateway to Kasbah's marketplace requires human users to adopt certain predetermined rules of engagement, many of which were built directly into the system.⁴⁴ In the open systems of the future, intelligent agents would be free to roam the Internet in search of transaction partners without any preexisting commitment to the same rules of engagement as those preferred by other electronic agents encountered along the way. In such a world, the threat of commercial uncertainty looms large. Without the ability to set out the rules in advance, the parties to an agent mediated agreement would be forced to rely on existing contract formation rules to ensure that their agreement is enforceable. For the reasons discussed below, this is potentially problematic.

41. To partake in Kasbah, one must be registered as a member of the system.

42. J. E. White "Mobile Agents" in J.M. Bradshaw, ed., *Software Agents* (Menlo Park, Calif.: AAAI Press; Cambridge, Mass.: MIT Press, 1997).

43. Many computer scientists believe that intelligent agents will one day be able to adopt negotiation strategies autonomously.

44. See e.g. *Model Interchange Agreement for the International Commercial Use of Electronic Data Interchange*, UN/ECE Rec. 26, TRADE/WP.4/R11133/Rev.1, (1995), online: UNECE <<http://www.unece.org/trade/rec/rec26en.htm>> (last modified: 20 April 1998).

4. The Failings of Traditional Contract Doctrine

4.1 *Only Legal Persons Can Contract*

There are several aspects of an automated transaction that make it difficult to perceive and understand it as contractual in nature. In part, this is because the very notion of a contract is founded on the idea of an exchange of promises. A promise is a kind of moral undertaking that is intended by the person who makes it to voluntarily impose limits on his or her future freedom of action.⁴⁵ Understood as a moral institution, the idea of promising does not lend itself well to machines. As it was for Denning M.R. in the case involving the automated parking attendant, one is always tempted to look behind the machine to see who really made the promise said to underlie the automated transaction.⁴⁶

Problems are bound to arise, if it becomes possible for machines to generate transactions independent of human interaction. As Fridman and others have pointed out

Since a contract is an agreement between two or more persons, and involves the idea of consent, only those who have the power to give consent can contract.⁴⁷

Inextricably tied to the notion of contractual consent is the idea that the *consenting person* has signified an intention to be bound by the terms of the agreement. As Fridman puts it, “[a] contract can only arise, if there is the *animus contrahendi* between the parties. Without the expressed or implicit intention that a contract should emerge as a result of the language or conduct of the alleged parties, no contractual obligations can be said to exist and be capable of enforcement. Hence, the offer that is made must be an offer to contract involving the creation of legal relations.”⁴⁸

While it is true that only legal persons have the legal power to contract, it is also true that the law can extend the scope of juristic personality so as to create limited rights and obligations for human artifacts, such as corporations. Admittedly, the law is perfectly capable of producing other kinds of artificial

45. See C. Fried, *Contract as Promise: a Theory of Contractual Obligation* (Cambridge Mass.:Harvard University Press, 1981)

46. As Denning M.R. put it in *Thornton v. Shoelane Parking*, *supra* note 7 at 689, “Assuming, however, that the automatic machine is a booking clerk in disguise...”

47. *Supra* note 1 at 138.

48. *Ibid.* at 26.

persons. However, no legislature or judge has yet chosen to deem intelligent agents to be artificial persons. Since they are not considered to be legal persons, intelligent agents lack the legal power to give consent. Although some academics have offered the somewhat radical suggestion that future electronic agents should be included among the category of legal persons,⁴⁹ it is clear that intelligent agents do not currently enjoy the status attributed to legal persons. Consequently, absent the enactment of legislation or a common law rule to the contrary, an intelligent agent cannot be a party to a contract.

4.2 Contractual Capacity

Even if the law came to recognize electronic agents as legal persons, it is not clear that every electronic agent would be capable of entering into a contract. As stated by Cheshire and Fifoot, “[i]f all of the elements of contract exist between two parties, the agreement may, nevertheless, lack legal effect, if one or both of the parties lack capacity to contract.”⁵⁰ In other words, prior to giving legal effect to their agreements, the law has traditionally required of all persons that they be capable of demonstrating a certain degree of intellectual capacity. To take a typical example, there exists a well-established rule that limits the contractual capacity of those said not to be of sound mind. As Fridman puts it, “[o]nce a person has been found by a court to be wanting in intellect, then it would seem to follow that such a person lacks contractual capacity. He or she is not able to consent.”⁵¹ At present, it is not clear that computers will ever achieve cognition, let alone sufficient cognition to meet the capacity requirement. As such, it is doubtful whether computers will ever be in a position to contract as independent entities.⁵²

Before a determination can be made as to whether it is possible for an intelligent agent to have the legal capacity to contract, it is important to

49. See *e.g.*, C. Karnow, “Liability for Distributed Artificial Intelligences” (1996) 11 Berkeley Tech. L. J. 147; L. Wein, “The Responsibility of Intelligent Artifacts: Toward an Automation Jurisprudence” (1992) 6 Harv. J.L. & Tech. 103; L. Solum, “Legal Personhood For Artificial Intelligences” (1992) 70 N.C.L. Rev. 1231.

50. J.G. Starke, N.C. Seddon & M.P. Ellinghaus, eds., *Cheshire and Fifoot’s Law of Contract*, 6th Australian ed. (Sydney: Butterworths, 1992) at 545.

51. *Supra* note 1 at 158.

52. Although it is perfectly plausible that they will be able to act as agents in the legal sense, given that agents do not generally require the capacity to contract for themselves in order to contract for others. This point will be further considered below in Part 6.

recognize that the doctrine of contractual capacity serves a function beyond the determination of who is, in fact, able to consent to an agreement. As Waddams has made clear, one of the central reasons underlying the capacity doctrine is the aim of protecting weaker parties during the bargaining process.⁵³ According to Waddams, “[f]rom the basic desire to protect minors from exploitation arose a general rule that minors’ contracts were voidable at the minor’s option.”⁵⁴ If Waddams is right to link the issue of contractual capacity to the general desire to protect weaker parties when entering into agreements, this adds a wrinkle to the question about whether an electronic agent should be said to have the capacity to contract.⁵⁵ In any event, even the most intelligent and autonomous of agents currently utilized in electronic commerce seems to lack the capacity to contract.

4.3 *Consensus Ad Idem*

The traditional view of contract includes not only an exchange of promises but also “a mutual concordance between the parties as to the nature and scope of the rights and obligations that coincide with that exchange of promises.”⁵⁶ That is, the essence of contract is agreement. The metaphor which has taken hold, at least within the common law tradition, is the notion of a *consensus ad idem* - a meeting of the minds. Historically, this metaphor was based on the paradigm of face-to-face interactions between two human beings. Bearing in mind this historical point, it is not difficult to understand that automated transactions do not easily fit within this conceptual framework. In what sense could it be said that electronic agents in the Kasbah marketplace exchange promises, or that two T@T agents reach a meeting of the minds?

53. S. M. Waddams, *The Law of Contracts*, 3rd ed. (Toronto: Canada Law Book, 1993) at 447.

54. *Ibid.*

55. The capacity issue, as conceived by Waddams, would become extremely complicated in a world where computers programs are said to have the capacity to contract. Neural net programming raises the spectre of vast inequalities between the various competing electronic devices. Intelligent agent technology is bound to grow in power and sophistication, to the point where the more advanced agents will likely be able to predict the actions and thus take advantage of older, more obsolete versions. It is also likely that only large corporations and wealthy individuals will have access to state-of-the-art agent technology. If the law of contract is to protect weaker parties, it might somehow have to take steps to level the playing field. Should situations such as this be conceived of as analogous to that of sophisticated parties contracting with the infirm?

56. *Supra* note 1 at 5.

57. See e.g. C. Fried, *supra* note 45; Fuller & Purdue, “The Reliance Interest in Contract Damages” (1936) 46 *Yale L.J.* 52. For an exhaustive criticism of this point of view, see P.S. Atiyah, *The Rise and Fall of Freedom to Contract* (Oxford:Clarendon Press, 1979); R.K.L. Collins, ed., *The Death of Contract by Grant Gilmore* (Columbus:Ohio State University Press, 1995).

It is essential to recognize that the notion of a *consensus ad idem* does not merely signify the mutual concordance between two parties. The agreement requirement also underscores the *voluntary* aspect of contract. After all, the traditional understanding of what makes such an exchange of promises special, what makes such an agreement binding both in law and in moral theory, is the underlying idea that the parties to the agreement have each exercised free will; each person freely chose to make representations about the future that created both trust and reliance in the mind of the other and each person thereby assumed obligations not otherwise existent in law.⁵⁷ Aside from a few fairly radical computer scientists,⁵⁸ most of us do not presently conceive of electronic agents as having free will or as capable of making voluntary undertakings meant to limit future freedom of action.

In sum, when one considers the fact that intelligent agents are not legal persons, that they lack the capacity to contract and that they are incapable of reaching a *consensus ad idem*, it is unclear whether the transactions autonomously generated by agent technology will be considered binding in law. For this reason and others, law makers in most jurisdictions are proposing legislation aimed at curing these and other doctrinal defects. Such legislation is thought to be necessary, in order to ensure public confidence in the future success of electronic commerce.

5. Electronic Commerce Legislation⁵⁹

5.1 UNCITRAL Model Law

Uncertainty regarding the rules of contract formation in electronic commerce is by no means restricted to automated transactions. Questions about when or where a contractual offer is made or accepted and, ultimately, whether a contract has been formed, also arise when human beings are at both ends of an electronic interaction.

The need to resolve a variety of contract formation issues peculiar to electronic commerce was recognized globally in December of 1996, when the General Assembly of the United Nations Commission on International Trade

58. M. Minsky, "Will Robots Inherit the Earth?" *Scientific American* 271:4 (October 1994) 108; W. D. May, *Edges of Reality: Mind vs. Computer* (New York: Insight Books, 1996); G. Simons, ed., *Are Computers Alive?* (Boston: Thetford Press, 1983) c.6; F. George, *Machine Takeover* (Oxford: Pergamon Press, 1977) at 93-113.

59. See *Model Law on Electronic Commerce*, GA Res. 51/162, UN GAOR, 51st Sess., UN Doc. A/51/628, (1997) at IA6, online: UNCITRAL <<http://www.un.or.at/uncitral/englishtexts/electcom/ml->

Law recommended that all member States give favourable consideration to adopting its Model Law on Electronic Commerce. This recommendation was based on the General Assembly's belief in the need for uniformity of the law applicable to alternatives to paper-based methods of communication and storage of information. The perceived need for uniform legislation was based on the recognition that the electronic communication of legally-significant information may be hindered by legal obstacles to the use of such messages, or by uncertainty as to their legal effect or validity. According to its authors, the purpose of the Model Law is to provide national legislators with a set of internationally- acceptable rules as to how a number of such legal obstacles may be removed. The principles expressed in the *Model Law* were also intended to be of use to individual users of electronic commerce in the drafting of some of the contractual solutions that might be needed to overcome the legal obstacles.

The formulation of the *Model Law* was undertaken in response to the fact that current legislation in most jurisdictions does not always accommodate transactions conducted through electronic media. To take an obvious example, certain kinds of contracts are enforceable only if they are evidenced in writing. Without modifying legal requirements of this sort, it is uncertain whether the courts will recognize information that is presented in a form other than the traditional paper document. One of the central objectives of the *Model Law*, therefore, is to facilitate electronic commerce, by providing equal treatment to users of paper-based documentation and to users of computer-based information. In a nutshell, the aim is to create a media-neutral environment for commercial enterprise. In order to combat the traditional specification of a medium for a particular formal requirement in any given piece of legislation, the strategy adopted by the *Model Law* allows the traditional requirement to be met through the use of modern functional equivalents.

ec.htm> (last modified: 29 January 1999) [hereinafter Model Law]; *Uniform Electronic Transactions Act* (draft approved at July 1999 annual conference), online: National Conference of Commissioners of Uniform State Laws <<http://www.law.upenn.edu/bll/ulc/uecicta/uetast84.htm>> (last modified: 26 October 1999) [hereinafter *UETA*]; *Uniform Computer Information Transactions Act* (draft approved at July 1999 annual conference), online: *Uniform Law Commissioners* <<http://www.law.upenn.edu/bll/ulc/ucita/cita10ct.htm>> (last modified: 25 October 1999) [hereinafter *UCITA*]; *Uniform Electronic Commerce Act* (draft August 1999), online: Uniform Law Conference of Canada <<http://www.law.ualberta.ca/alri/ulc/current/euecafa.htm>> (last modified: 23 November 1999) [hereinafter *UECA*]; *Electronic Transactions Act 1998*, online: Government of Singapore <<http://www.cca.gov.sg/eta/index.html>> (last modified: 11 June 1999); *Electronic Transactions Act 1999*, online: Australia Attorney General's Department <<http://scaleplus.law.gov.au/html/pasteact/3/3328/top.htm>>.

Consider, for example, a traditional rule which requires a signature at the bottom of a document for certain kinds of transactions. In a medium that does not allow for a physical mark to be affixed to the page, its functional equivalent - the clicking of a mouse - is permitted instead. The action of clicking a mouse in response to a particular query provides the functional equivalent of a signature. Namely, it identifies the individual responding to an offer and it signifies assent to the terms of the offer.

When operations that provide the functional equivalent to a signature are machine generated by an autonomous intelligent agent, it becomes necessary to invoke a special rule which attributes those operations to some human or corporate entity. Consequently, the majority of electronic commerce legislation currently proposed in various jurisdictions contain some sort of *attribution rule*. In essence, the effect of an attribution rule is to treat the operations of the automated agent as a mere extension of the actions of the human being who initiated its use. As stated in the "Guide to Enactment" accompanying the *Model Law*, "[d]ata messages that are generated automatically by computers without human intervention should be regarded as 'originating' from the legal entity on behalf of which the computer is operated."⁶⁰

The typical justification for this approach is exemplified by comments that were made during a meeting of the Drafting Committee for a subsequent variation on the *Model Law* adopted in the United States,⁶¹ which underscored "that the key aspect of this term is its function as a tool of a party."⁶² The Reporter's Notes state that

As a general rule, the employer of a tool is responsible for the results obtained in the use of that tool, *since the tool has no independent volition of its own*. ... This Act provides that a person is responsible for the actions taken and accomplished through electronic agents, in the absence of human intervention.⁶³

This approach has led to the development of an attribution rule in Article 13, subsection 2 of the *Model Law*, which provides in that

- 2) As between the originator and the addressee, a data message is deemed to be that of the originator, if it was sent:

60. See Reporter's Note 35, *Model Law*, *supra* note 59.

61. *UETA*, *supra* note 59.

62. See Reporter's Note under Section 102(5) Electronic Device, *UETA* (July 24, 1998 Draft), online: National Conference of Commissioners of Uniform State Laws <<http://www.law.upenn.edu/library/ulc/uecicta/98am.htm>> (last modified: 24 April 1999).

63. *Ibid.* (emphasis added).

- (a) by a person who had the authority to act on behalf of the originator, in respect of that data message; or
- (b) by an information system programmed by, or on behalf of, the originator to operate automatically.⁶⁴

Article 13 contemplates the fact that many contractual offers are transacted by intermediaries. Where the intermediary is another person, subsection 2 (a) provides that the offer made by that person is attributed to the originator, on the basis of the common law notion of *authority*.⁶⁵

Subsection 2 (b) attributes the operations of an ‘information system’ to its originator. According to the definition set out in Article 2 of the *Model Law*, an ‘information system’ means “a system for generating, sending, receiving, storing or otherwise processing data messages.”⁶⁶ Clearly, this definition will include intelligent agent technology. The legal effect of subsection 2 (b) is that each operation of an intelligent agent employed as an intermediary in an electronic transaction will be attributed to the person who originated its use. Though subsection 2 (b) does not make intelligent agents the subject of rights and obligations,⁶⁷ such agents are treated in precisely the same manner as persons who have been given the authority to act on the originator’s behalf. That is, they have the power to bind the originator.

Still, the *Model Law* does not include intelligent agents within the statutory definition of ‘intermediary’ in electronic commerce. An ‘intermediary’ is defined in Article 2 (e) as “a person who, on behalf of another person, sends, receives or stores that data message or provides other services with respect to that data message.”⁶⁸ Thus, even though the *Model Law* contemplates the use of intermediaries in electronic commerce, it distinguishes between transactions carried out by persons from those carried out by automated means. The important difference is that the scope of attribution for human intermediaries is limited by the common law principle of authority, whereas the attribution rule for automated intermediaries is founded on the basis of absolute liability. In other words, in the case of an automated transaction, the *Model Law* precludes a court from inquiring whether the originator consented to the transaction in question. Consequently, the *Model Law*’s attribution rule for intelligent agents could lead to unjust

64. *Model Law*, supra note 59.

65. The authority concept will be further discussed in Part 6.

66. *Model Law*, supra note 59.

67. See the *Model Law*, “Guide to Enactment” at para. 35, supra note 59.

68. *Model Law*, supra note 59 (emphasis added).

results in situations where a transaction generated by the intelligent agent is unintended, unforeseen or unauthorized by its human originator.

4.2 *The Proposed Uniform Electronic Transactions Act*⁶⁹

The UETA, which was recently adopted by the National Conference of Commissioners on Uniform State Laws, deals with intelligent agents and other software devices in a more sophisticated manner than the *Model Law*, by expressly recognizing that such devices can operate independent of any human review.⁷⁰

14. In an automated transaction, the following rules apply:

- (1) A contract may be formed by the interaction of electronic agents of the parties, even if no individual was aware of or reviewed the electronic agents' actions or the resulting terms and agreement.
- (2) A contract may be formed by the interaction of an electronic agent and an individual, acting on the individual's own behalf or for another person, including by an interaction in which the individual performs actions that the individual is free to refuse to perform and which the individual knows or has reason to know will cause the electronic agent to complete the transaction or performance.
- (3) The terms of the contract are determined by the substantive law applicable to it.

It is important to note that the language in the *UETA* is permissive. Rather than deeming the operations of an electronic agent to be those of its originator, section 14 of the *UETA* permits a contract to be formed by the interaction of electronic agents or the interaction of an electronic agent and an individual.⁷¹ In addition to enabling electronic agents to contract, the section provides a mechanism for click-through transactions. Part of its effect is to validate

69. *UETA*, *supra* note 59.

70. *Ibid.* see s.2 (2) definition of "Automated transaction" and s.2 (6) definition of "Electronic agent". The Reporter's Notes in the July, 1998 Draft indicate that this Act favours the use of the term *electronic agent* over the term *electronic device* (which had been used in previous drafts). The motivation behind this change is based largely on the desire for uniformity with UCC-2B (precursor to the *UCITA*, which will be discussed below in Part 4.4), as well as the recognition that the term *electronic agent* has become a "near term of art."

71. *UETA*, s. 14, *supra* note 59.

online transactions where a consumer effects a purchase by interacting with an electronic agent on a commercial Web site. It may also affect other informational transactions, such as agreements in which one party enables another to use information contained on a Web site for personal purposes in exchange for a promise to agree to the Web site owner's terms and conditions.⁷²

Two other provisions in the UETA are involved in its attribution process. Section 9 (a) has the effect of attributing an electronic record or electronic signature to a person, when that record or signature resulted from the operations of his or her electronic agent. This section is a more elegant version of Article 13 of the *Model Law*. In addition to attributing the operations of electronic agents to the persons utilizing them, section 9 (a) highlights the important role of security procedures (attribution procedures) in the electronic environment. It allows the act of a person to be shown in any manner, "including a showing of the efficacy of any security procedure applied to determine the person to which the electronic record or electronic signature was attributable."⁷³ It is not surprising that reliable authentication mechanisms will become necessary, as electronic agents are used more and more to create electronic records and electronic signatures.

The final relevant provision in the UETA is section 10. Although this section deals primarily with the legal effect of changes or errors in an electronic record, subsection (2) contains a special provision for mistakes that occur in the contract formation process, as between an individual and an electronic agent.

10 (2) *In an automated transaction involving an individual, the individual may avoid the effect of an electronic record that resulted from an error by the individual made in dealing with the electronic agent of another person, if the electronic agent did not provide an opportunity for the prevention or correction of the error and, at the time the individual learns of the error, the individual:*

- (A) promptly notifies the other person of the error and that the individual did not intend to be bound by the electronic record received by the other person;
- (B) takes reasonable steps; including steps that conform to the other person's reasonable instructions, to return to the other person or, if instructed by the other person, to destroy the consideration received, if any, as a result of the erroneous electronic record; and

72. For example, a promise not to use the information for certain prohibited purposes.

73. *UETA*, *supra* note 59 (emphasis added).

(C) has not used or received the benefit or value of the consideration, if any, received from the other person.⁷⁴

Such a provision is premised on a recognition that the process of automation may generate a number of unexpected results in the form of human mistakes, such as keystroke errors. This provision makes up for the fact that, in an automated transaction, it will not always be possible for an individual to communicate to the electronic agent after the fact that he or she hadn't meant to enter into the transaction. The section seeks to accomplish these things without otherwise disturbing the law of mistake. In fact, subsection 10 (3) specifically refers to the substantive law and indicates that it applies, as always, with the exception of the circumstances contemplated in subsections (1)⁷⁵ and (2). The section also seeks to provide an incentive for the implementation of error correction mechanisms.

In the context of consumer purchases, subsection 10 (2) is an important provision. According to it, an individual will be precluded from avoiding a transaction on the basis of a mistake, in cases where the electronic agent has provided an opportunity for the individual to prevent or correct the error. The focus of subsection 10 (2) is solely on human errors in automated transactions. However, in addition to situations where an individual transmits an offer or an acceptance by accident, it is also possible that an electronic agent might malfunction or, more likely, function properly, though unpredictably, to transmit an offer or acceptance that was unintended, unforeseen or unauthorized by the person on whose behalf the electronic agent was operating. Nothing in this provision or in any other section of the *UETA* contemplates this possibility. Aside from its potential to yield unjust results, the failure to include electronically generated mistakes in this section might provide a disincentive to merchants in electronic commerce. It is not difficult to imagine that merchants would be hesitant to utilize autonomous agent technology, if that technology is given an unlimited power to bind them, regardless of the circumstances of the transaction.

4.3 *The Proposed Uniform Electronic Commerce Act*⁷⁶

Though the UECA was designed to implement the principles underlying the *Model Law in Canada*, its scope extends beyond electronic commerce.

74. *Ibid.*, s.10 (emphasis added).

75. Subsection (1) applies when the parties have agreed to use a security procedure but one of the parties has not conformed to the procedure.

76. *UECA*, *supra* note 59.

The *UECA* also contemplates a number of other legal relationships that rely on documentation, e.g., the transaction of information between individuals and government. In order to facilitate the resolution of disputes relating to the formation of contracts or, more generally, disagreements about when an informational transaction is said to have taken place, Part 2 of the proposed *UECA* sets out default rules for the communication of documents. Among other things, Part 2 contemplates the communication of information by means of an electronic document or by electronic interactions, such as clicking on an appropriately-designated icon on a computer screen.⁷⁷ Part 2 also contemplates automated communications accomplished through the use of electronic agents. Section 19 defines an electronic agent as “a computer program or any electronic means used to initiate an action or respond to an electronic documents [sic] or actions [sic] in whole or in part without review by a natural person at the time of the response or action.”⁷⁸ Section 21 provides that, “[a] contract may be formed by the interaction of an electronic agent and a natural person or by the interaction of electronic agents.”⁷⁹

The proposed Canadian legislation adopts the elegant approach put forth in the *UETA*, in that it avoids the need for a distinct attribution rule. Rather than attributing the operations of the electronic agent to the acts of its human or corporate initiator, the *UECA* simply permits contracts to be performed by the interaction of electronic agents. Although the provision does not expressly contemplate the possibility that an electronic agent might operate more like an intermediary than an instrument, section 21 might be drafted in a manner that is sufficiently flexible to accommodate such a possibility.

Section 22 of the *UECA* contains an error provision that renders certain transactions between a natural person and an electronic agent of no legal effect. The error provision is practically identical to *UETA* section 10 (2) discussed above. If a natural person makes a material error⁸⁰ while transacting with an electronic agent, but notifies the other person of the error as soon as practicable and takes reasonable steps in responding to instructions concerning the return (or destruction) of the consideration prior to receiving any material benefit, the transaction will be unenforceable. The section applies, only if the electronic agent did not provide a method of preventing or correcting the error. As the annotation to this section indicates, “[t]his provision gives online merchants a way of giving themselves a good deal of security against

77. See section 20 *UECA*, *supra* note 59.

78. *UECA*, *supra* note 59.

79. *UECA*, *supra* note 59.

allegations of mistake, and encourages good business practices in everybody's interests."⁸¹

Like section 10 (2) of the *UETA*, the mistake provision in section 21 of the *UECA* restricts its focus to mistakes made by a person, while interacting with an electronic agent. With the aim of producing straightforward legislation, the drafters of *UECA* chose to avoid altogether the difficult issue of mistakes generated by electronic agents. The failure to address this issue is sure to become problematic, for the very reasons articulated above in the analysis of section 10 (2) *UETA*.

A. *The Civil Code of Quebec*⁸²

Like the *UETA*, the primary aim of the *UECA* is to cure the deficiencies of common-law contract doctrine. The Canadian model law does not specifically contemplate the challenges posed by the civil law tradition viz. the contract-formation issues bound to arise in electronic commerce, as a result of the *Civil Code of Quebec* (C.C.Q.). Fortunately, because the C.C.Q. follows the tradition consensualiste, many of the issues are the same.

For example, the civil tradition in Quebec also requires contracting parties to be legal persons who have the capacity to consent to an agreement. According to article 1378 C.C.Q.:

“A contract is an agreement of wills by which one or several *persons* obligate themselves to one or several other *persons* to perform a prestation.”

The C.C.Q. doesn't define “person”, but articles 1 and 298 provide that every human being possesses juridical rights, and legal persons are endowed with juridical personality. It is unlikely that computer software programs fit within these definitions.

Consent to contract, according to article 1386 C.C.Q., “is accomplished by the express or tacit manifestation of the will of a person to accept an offer to contract made to him by another person.” Like the common law tradition, article 1398 C.C.Q. requires that the person manifesting consent to be capable of binding himself. In other words, he or she must have the capacity to contract. According to article 1409 C.C.Q., the rules relating to capacity to

80. *E.g.* clicks “Yes” when she meant “No”, or ordered “10,000,000” units of product instead of “10”.

81. *UECA*, *supra* note 59.

contract are “laid down principally in the Book on Persons.” Once again, the requirement of consent makes it difficult to recognize contracts that are made independently of human interaction - unless they are somehow consented to in advance or ratified after the fact.

One challenge posed by the civil tradition, that does not exist at common law, is the requirement that the contract have a cause and an object. According to article 1410 C.C.Q.:

The cause of a contract is the reason that determines each of the parties to enter into a contract.

Although article 1410 C.C.Q. stipulates that “the cause need not be expressed”, it is something of a fiction to describe an automated transaction as one which was entered into by a person with cause. Perhaps, even more problematic is the requirement in article 1412 C.C.Q. that the parties to a contract must envisage its juridical operation *at the time of its formation*. In the case of automated transactions, this requirement will never be met. If it turns out that intelligent agents are able to transact independently of human review, the object of the contract will not truly be known by the parties until sometime well after its supposed formation.

B. *The Code de la Sécurité inforoutière*⁸³

Currently under consideration by the *Direction des affaires juridiques et législatives* of Quebec is a statute to be known as *Code de la Sécurité inforoutière*. In a manner similar to the *Model Law, UETA* and *UECA*, the aim of this proposed legislation is to clarify and to modernize a number of provisions in the C.C.Q., so that they are not an impediment to electronic commerce. The provisions in *Code de la Sécurité inforoutière* pertain to such things as signatures,⁸⁴ original documents and their reproduction,⁸⁵ writing requirements,⁸⁶ etc. It is not yet known whether the *Code de la Sécurité inforoutière* will provide for electronic agents and automated transactions. Given that most of the contract formation requirements relevant to agent-mediated electronic commerce are similar in both the civil and common-law

82. *Civil Code of Quebec*, S.Q. 1991, c.64 [hereinafter C.C.Q.].

83. See J. Proulx & L. Goulet, “La sécurité inforoutière” (1999), online: Conseil du trésor <<http://www.autoroute.gouv.qc.ca/dossiers/secprotec.htm>> (last modified 15 March 2000).

84. Art. 2827 C.C.Q.

traditions, it is not clear that Quebec needs an additional code to deal with automated electronic commerce.⁸⁷

4.4. *The Proposed Uniform Computer Information Transactions Act*⁸⁸

During the last several years, the American Law Institute worked in collaboration with the National Conference of Commissioners on Uniform State Laws to develop a set of coherent legal standards, in support of electronic transactions. Originally, it was thought that the proposed legislation would be incorporated into the *Uniform Commercial Code* as Article 2B. However, on April 7, 1999, it was announced that the National Conference of Commissioners on Uniform State Laws would promulgate legal rules regarding computer information transactions, as a separate Act entitled *Uniform Computer Information Transactions Act (UCITA)*. Like its predecessors, the *UCITA* is being created in response to the tremendous growth in the information industry and is intended to address the need for uniformity and clarity in the online environment. The Act purports to deal with three issues of contract law that apply to electronic commerce: i) the authentication of electronic records, ii) the manifestation of assent, and iii) the attribution of electronic messages. The newly-proposed draft was presented at the meeting of the NCCUSL in Denver, Colorado in July, 1999. It was adopted in principle and is now subject to revision by the NCCUSL Committee on Style. The *UCITA* has been targeted for enactment in all 50 states, the District of Columbia, the U.S. Virgin Islands and Puerto Rico.

UCITA section 202 contains a general provision on contract formation which validates transactions entered into by electronic agents:

- S.202 (a) A contract may be formed in any manner sufficient to show agreement, including offer and acceptance or conduct of both parties or operations of electronic agents which recognize the existence of a contract.⁸⁹

The language here is somewhat different than the language found in the *Model Law*, *UETA* and *UECA*. S.202 (a) implies that a contract will be

85. Art. 2837-2842; 2860 C.C.Q.

86. *Interpretation Act*, R.S.Q. c. I-16, s.61.

87. Assuming that Quebec adopts its own version of the *UECA*.

88. *UCITA*, *supra* note 59.

89. *UCITA*, *supra* note 59.

formed through the operations of electronic agents, only if the transaction demonstrates *the existence of an agreement between the parties* using the electronic agents. This requirement is effective and important. It furthers the objective of creating a media neutral environment while, at the same time, it harmonizes electronic commerce with the traditional common and civil law approaches to contract formation.

The attribution rule in *UCITA* subsection 213 (a) is perhaps the most insightful and innovative provision in the existing global body of electronic commerce legislation:

S.213 (a) An electronic authentication, display, message, record, or performance is attributed to a person if it was the act of that person or its electronic agent, *or if the person is bound by it under agency or other law*. The party relying on attribution of an electronic authentication, display, message, record, or performance to another person has the burden of establishing attribution.⁹⁰

The first sentence in subsection (a) is generally meant to parallel article 13 of the *Model Law*, section 9 of the *UETA* and section 21 of the *UECA*. It does, however, contain a major addition. The provision attributes the operations of an electronic agent to its originator, where he or she is otherwise “bound by it under the law of agency or other law.”⁹¹ By including agency law as part of its attribution procedure, the drafters of *UCITA* contemplate that future electronic agents might operate as autonomous commercial intermediaries, i.e., that future electronic agents will have the power to unilaterally alter the legal positions of their originators. In so doing, *UCITA* recognizes that the sophistication of the technology in the near future might make it disingenuous, if not commercially disadvantageous, to treat the operations of an electronic agent as though it were “a mere extension of the person utilizing it.”⁹² In essence, *UCITA*’s extension of agency law to intelligent agent technology provides a legal principle by which the liability of an originator can be limited in circumstances where the automated transaction is unintended, unforeseen or unauthorized by its human originator.

90. *UCITA*, supra note 59 (emphasis added).

91. *Ibid.*

92. See Reporter’s Note under Section 202 *Uniform Commercial Code-2B* (March 10, 1998 Draft), online: National Conference of Commissioners of Uniform State Laws <<http://www.law.upenn.edu/library/ulc/ucc2/2b398.htm>> (last modified: 23 April 1999).

Such a provision affords the type of legal safeguard that is necessary for cautious merchants in electronic commerce, who would be hesitant to use agent technology, if the attribution rules had the effect of providing electronic agents with an unlimited power to bind them, without regard to the circumstances of the transaction.

Nevertheless, there are several respects in which section 213 is problematic. First, it is not clear that a person would be bound by an *electronic agent* under the traditional law of agency. The doctrinal difficulties enumerated in Part 3 above might preclude the possibility of invoking the law of agency without an additional deeming provision that would expressly make it applicable to electronic agents. Section 213 does no such thing. Second, subsection 213 (a) fails to articulate the relevant principles of agency to be applied in electronic commerce. What of the agency-law rules dealing with the relationship between agent and originator?⁹³ Are those rules relevant? Can agency law be invoked to the effect that duties are owed to the electronic agent by the person using it or *vice versa*? And what about the possibility of duties owed by an electronic agent to a third party? By referring to the law of agency without articulating which aspects of it are relevant, the above provision confuses the law of electronic commerce, rather than clarifies it.

The remainder of section 213 pertains to the rules surrounding an attribution procedure chosen by the parties themselves. These rules are similar to the *UCITA* attribution procedure outlined above.

UCITA section 107 sets out the conditions under which a person will be bound by the operations of an electronic agent. That provision specifically contemplates the possibility of *autonomous* electronic agents, by stipulating that “even if no individual was aware of or reviewed the agent’s operations or the results of the operations.”⁹⁴ It enumerates three uses of electronic agents in electronic commerce. First, electronic agents can be used to *authenticate records* either by electronically signing documents on a person’s behalf or otherwise. Second, an electronic agent can be used to *perform certain contractual duties*. If the transaction involves an exchange of information, or information in exchange for something else, there are circumstances in which an electronic agent can perform some or all of the obligations undertaken by the person for whom it is operating. For example, a Web-based music provider can employ an electronic agent in conjunction

93. Outside of the context of electronic commerce, the person on behalf of whom the agent is acting is generally known as the principal.

94. *UCITA*, s.107 (d), supra note59.

with MP3 technology to fill orders without human oversight or intervention.⁹⁵ Third, in addition to authenticating records and performing contractual duties, electronic agents can be used to *manifest a person's* assent. Although it is presently nonsensical to say that an electronic agent has the capacity to consent to contract on its own, it makes perfect sense to say that an electronic agent can be used to manifest the assent of the person who has originated its use.⁹⁶ Even primitive machines, such as automated parking attendants, can be used in such a way.

UCITA goes further than any of the other proposed legislation, by virtue of the fact that it defines the contractual notion of a “manifestation of assent” in the context of electronic commerce. Section 112 stipulates that an electronic agent manifests assent on behalf of the person using it if, “after having an opportunity to review”⁹⁷ a record or term, the electronic agent authenticates it or “engages in operations that the circumstances indicate constitute acceptance.”⁹⁸ This provision attempts to make it clear that the manifestation of assent requires circumstances that constitute a person's acceptance of an offer.⁹⁹

Like the *UETA*, *UCITA* also recognizes that electronic commerce is likely to generate errors that will not be immediately detected by electronic agents. It, therefore, contains a similar attribution procedure for the detection of changes and errors.¹⁰⁰ Unlike section 10 of the *UETA* cited above, *UCITA* section 214 applies only in the case of consumer transactions. Still, it will not permit a consumer to avoid an automated transaction merely because he has changed his mind. Although the section appears to contemplate “errors created by a consumer using an information processing system”, it fails to provide a mechanism that would allow the party using an electronic agent to

95. H.D. Rafter et al., “Streaming into the Future: Music and Video on the Internet” in *Patent, Copyrights, Trademarks, and Literary Property Course Handbook Series* (New York: Practising Law Institute, 1999) at 547; N.A. Bloom, “Protecting: Copyright Owners of Digital Music - No More Free Access to Cybertunes” (1998) *45 Journal of the Copyright Society of the USA*. 179; R. Harris, “Consumer Friendly Music Technology Threatens Industry Profits” *Nando Times* (Dec. 11, 1998) online: *Nando Media* <http://www.techserver.com/newsroom/ntn/info/121198/info6_2962_noframes.html> (last modified: 11 December 1998); J. Alderman, “Composing Music's Future Form” *Wired* (July 2, 1998), online: *Wired* <<http://www.wired.com/news/news/culture/story/13444.html>> (last modified: 11 June 1999).

96. See Reporter's Note under Section 202 *Uniform Commercial Code-2B* (March 10, 1998 Draft), online: National Conference of Commissioners of Uniform State Laws <<http://www.law.upenn.edu/library/ulc/ucc2/2b398.htm>> (last modified: 23 April 1999).

97. *UCITA*, s.112 (b), *supra* note 59.

98. *Ibid.* s.112 (b)(2).

99. Presumably, the manifestation of assent could refer to an offer as well.

avoid transactions where a machine-generated error has occurred. Fortunately, such a mechanism is contemplated in *UCITA* section 206. This section states that a contract may be formed by the interaction of electronic agents and that the contract's existence is established when performance commences but not if "the operations resulted from fraud, electronic mistake or the like."¹⁰¹ A provision that contains a mechanism for limiting contractual liability in the case of computer-generated mistakes is extremely important, yet this seems to be the only proposed legislation that addresses the issue. Unfortunately, the term "electronic mistake" is not defined anywhere in the *UCITA*.

5. The Shortcomings of an Attribution Rule

The majority of electronic commerce regimes currently under consideration employ some form of attribution rule. Attributing the operations of a machine to a human actor requires the adoption of a legal fiction. One must, in essence, pretend that anything issuing from the computer really issues from its human controller.¹⁰² One might therefore ask: why pretend? Why deem the operations of a computer to be that of its human initiator? The effect of a deeming provision is to create absolute liability on the part of those who use intelligent agent technology. Is this the right approach?

Perhaps the best rationale for employing an attribution rule is an extension of the widely accepted contract principle articulated in *L'Estrange v. Graucob*,¹⁰³ namely, that a person who signs a contract without reading it is normally bound by its terms. Of course, this principle is itself based on a more fundamental principle in the law of contract - the notion of reliance. As Atiyah once put it in the context of signed but unread contracts:

100. Like the *UETA*, if the parties have adopted a commercially-reasonable attribution procedure, the provision operates against the nonconforming party. See *UCITA*, s.214, *supra* note 59. "Attribution procedure" is defined in paragraph 102 (5) as a "procedure to verify that an electronic authentication, display, message, record or performance is that of a specific person or to detect changes or errors in the information. The term includes a procedure that requires the use of algorithms or other codes, identifying words or numbers, encryption, callback or other acknowledgment." "Commercial reasonableness" is described in section 212.

101. *UCITA*, s. 206 (a), *supra* note 59. The rest of section 206 serves to prevent a human being from altering or vitiating a contract by engaging in conduct to which the electronic agent cannot react.

102. See Allen & Widdison, *supra* note 5 at 43. For a general discussion of legal fictions, see I.R. Kerr, *Legal Fictions* (Ph.D. Dissertation, The University of Western Ontario 1995) (London, Ont.: Faculty of Graduate Studies, The University of Western Ontario, 1995).

103. [1934] 2 K.B. 394.

The truth is (a party) is bound not so much because of what he intends but because of what he does The man who signs a written contract is liable because of what he does rather than what he intends. And he is liable because of what he does, for the good reason that other parties are likely to rely upon what he does in ways which are reasonable and even necessary, by the standards of our society.¹⁰⁴

By analogy, those who operate software that has the ability to create reliance in the minds of others ought to be bound by the agreements generated by that software - whether or not those agreements were specifically intended. If an electronic agent authenticates a record, manifests a person's assent, commences or promises performance, the result will be that a reliance interest is created in the person on the receiving end. Admittedly, the analogy loses some of its initial plausibility, when one contemplates transactions between two electronic agents. In what sense could an electronic agent be said to rely on the agreement in situations where no human was ever aware of the particular transaction?

Still, there is some merit in this approach. By holding liable the person using an electronic agent for what *it does* rather than what he or she intends, the risk of producing unpredicted obligations is placed on the person who is best able to control that risk. If the risks are allocated in this manner, a strong incentive is provided to those who use electronic agents to ensure that they are properly programmed and monitored frequently.¹⁰⁵ There is, however, a certain danger inherent in attributing each and every computer communication to the human or corporate operator of the electronic agent. For example, the liability for an unintended transaction might in some circumstances be more appropriately attributed to the developer of the software rather than to its user. This is so in cases where the software malfunctions.¹⁰⁶

One can also imagine situations in which a transaction or series of transactions initiated by an electronic agent are not the result of a malfunction but were, nonetheless, unintended and, perhaps, even unforeseen by its operator. As contemplated above in Part 3.1, once electronic agents become more sophisticated, their use in business-to-business commerce is bound to

104. See P. Atiyah, *Essays on Contract*, (Toronto: Oxford University Press, 1986) c.2. See also R. Samek, "The Objective Theory of Contract and the Rule in *L'Estrange v. Graucob*" (1974) 52 Can. Bar. Rev. 351.

105. See Allen & Widdison, *supra* note 5 at 51.

106. Since the third party with whom the electronic device has transacted is not privy to any contract that might exist between the developer of the electronic device and the person using it, such liability would not be contractual in nature. For a general discussion of tort liability in this context, see J. J. Fossett, "The Development of Negligence in Computer Law" (1987) 14 N. Ky. L. Rev. 289; G.S. Takach, *Computer Law* (Toronto: Irwin Law, 1998) 288-304.

develop. Instead of employing small programs limited to individual elements of business activity, such as information search agents, inventory tracking, customer loyalty lists or general record-keeping, single-integrated agents will preside over multiple functions. To reiterate the example used above, a ‘super-agent’ might monitor the in-house stocks of manufacturing supplies, keep track of the rate of consumption, determine the need for new supplies, communicate with a number of suppliers, and be responsible for the bidding, contracting and ordering of those supplies.

Given the intricacy of such a system, a decision-making mechanism would be required to prioritize its various functions. Such a complex system could make it difficult, if not impossible, for the average user to predict how the super-agent would resolve a particular series of conflicts in a given set of circumstances. As supplies depleted, the need to bid for new supplies might become more urgent, something that might be programmed as an element of the software’s bidding strategy. At the same time, however, the super-agent might have been programmed to include as a priority the limiting of in-house stocks to conserve overhead or other warehouse resources. Further priorities might include keeping the rate of factory consumption at a certain level, the preference of certain suppliers over others, and so on.

An incredibly complex balancing act would follow, and any given outcome would depend on the way in which the priority structure is assigned to the super-agent. It is inevitable that such a program, if sufficiently complex, will occasionally make decisions that are perfectly logical, though completely unintended by its users. Certain combinations of priorities *might lead the software agent to form contracts that would never have been anticipated by its principal*. Given the complexity of the demands made upon the machine, this is bound to happen as easily with mechanized employees as with human ones. What should happen in such a situation, if an unintended offer is quickly snapped-up by some third party who is completely aware of the fact that the person using the device would never have consented to any such transaction? If the law simply attributes the communication initiated by the electronic device to its operator, without in any way accounting for the *intermediary events* initiated by the electronic agent, the result will surely be unjust, since the failure to recognize the intermediation will render inapplicable equitable relief that would have otherwise been available via the law of contract.¹⁰⁷ Recall, as well, that the error provisions in each of the proposed statutes (except *UCITA*) did not apply to persons using an electronic agent.

107. Because of the attribution rule, the person using the electronic agent will not be said to have been mistaken. Only if the electronic agent was recognized *as an intermediary* would the law of mistake apply.

The success of the approach articulated in most of the proposed and enacted statutes considered above will therefore depend on the adoption of a flexible principle that can operate in conjunction with the attribution rules. The role of such a principle would be to set limits on the contractual liability of persons using electronic agents, so that people will not necessarily be signing their lives away simply by choosing to initiate devices that have the potential to generate transactions that were unintended, unforeseen or unauthorized. Without some sort of limiting principle, electronic agents will have an unlimited power to bind those who use them. Not only is this unjust, it is impractical. Strict or even absolute liability simply will not foster the growth of electronic commerce.

6. Taking Seriously the Agency Metaphor

As has been suggested above, the choice to adopt an attribution rule carries with it a failure to recognize that electronic agents might soon become capable of operating as more than mere conduits or extensions of human action. Given that intelligent software might one day function more like an intermediary than an instrument, is there a case to be made for taking seriously the agency metaphor? Recall that the agency metaphor was the coinage of computer scientists, not lawyers. It was not originally meant to describe a person who is legally authorized by another to act for or in place of him.¹⁰⁸ The original vocation of agent technology was to provide a line of computer software that would automate mundane information transactions. The goal was merely to develop software that would operate as a kind of “personal digital assistant.”¹⁰⁹ Given these humble origins, is there a sense in which we might come to understand electronic agents as true legal intermediaries?

The question about how to treat an intermediary in a commercial transaction is, by no means, novel. To take an ancient example, the Romans dealt with similar difficulties in the context of slavery law. In fact, there are striking similarities between the legal status of Roman slaves and the current status of autonomous electronic agents.¹¹⁰ Like autonomous electronic agents, Roman slaves were afforded the legal power to independently perform various important commercial tasks upon command. At the same time, Roman slaves

108. *Black's Law Dictionary*, 6th ed., (St. Paul, Minn.: West Publishing, 1990) at 63

109. See *e.g.* P. Maes, *supra* note 3.

110. See Wein, *supra* note 49 at 110-111.

were not recognized as legal persons according to the *ius civile*.¹¹¹ Although they were not considered to be legal persons and therefore lacked the power to invoke the law for their own protection, Roman slaves were not treated merely as chattel either.¹¹² Their strange existence vacillated somewhere in between *res* and *persona*. Roman law included a number of rules that made it possible for slaves to participate in commerce in a meaningful way, often with the power to alter the legal positions of Roman citizens. For example, Roman slaves were permitted to enter into contracts.¹¹³ Given that slaves in Rome were without rights, such contracts could only be enforced through their masters. Still, this meant that a slave could enter into a contract and thereby bind a third party on his master's behalf.

If the promises made by software innovators come true and electronic commerce falls mainly in the hands of intelligent-agent technology, the electronic slave metaphor could turn out to be more instructive than typical metaphors used to describe the technology, such as the "personal digital assistant."¹¹⁴ Although they do not have the status of person in law, there might be good reason to treat electronic agents more like intermediaries than instruments - especially if the technology begins to display high levels of autonomy and intelligence. Of course, the aim of treating electronic agents in this way is not to confer rights or duties upon those devices. Rather, it simply provides a more sophisticated and appropriate legal mechanism which would allow persons interacting through an electronic intermediary to be absolved of liability under certain circumstances. As it was for the praetors in ancient Rome, the legislators of electronic commerce might decide that it is appropriate to enact a special set of rules that aim to define the scope of liability for those who choose to conduct commerce through the use of intermediaries, recognizing that the operations of a commercial intermediary are not always identical to those contemplated by the person initiating the use of that intermediary. To this end, it is useful to consider the authority principle, as developed in the modern law of agency.

111. *Institutiones Iustiniani* 2. 14. 2.; 3. 17. pr.; *Novellae Theodosius* 17. 1. 2.: *quasi nec personam habentes*. See also W.W. Buckland, *The Roman Law of Slavery* (New York: AMS Press, 1962) at 2-5.

112. As was generally the case with slaves in the southern United States. "Slaves, from their nature, are chattels, and were put in the hands of executors...declaring them to be personal estate.": *Walson's Ex'r v. Payne*, Fall T., 1794; *Wash. Rep.*, 1.8.; *Hawkins Adm'r. v. Craig*, 6 Monroe's Rep. 254. See generally B. Hollander, *Slavery in America: Its Legal History* (London: Bowes & Bowes, 1962).

113. *Institutiones Iustiniani*, Tit. XVII *De Stipulatione Servorum*; *Institutiones Iustiniani*, D. xlv. 1. 130; See also Hadley, *Introduction to Roman Law, In Twelve Academical Lectures* (New York: D. Appleton and Company, 1873) at 114.

114. See P. Maes, *supra* note 3.

In the common law tradition, agency law is often described as having an internal and an external aspect.

The external aspect is that under which the agent has the powers to affect the principal's legal position in relation to third parties. The internal aspect is the relationship between principal and agent, which imposes on the agent (subject to contract) special duties vis-à-vis the principal, appropriate to the powers which he can exercise on the principal's behalf.¹¹⁵

Since the internal aspect of agency is said to govern the legal relation between principal and agent, it is not relevant to automated electronic commerce. This is because electronic agents are not presently the subject of rights or duties and, therefore, cannot be understood to owe any duties to the persons who originate their use. Consequently, the only relevant aspects of agency law are the external ones, i.e., those that pertain to the relationship between the person who initiates an automated transaction and any third parties who transact with that person through an electronic agent.¹¹⁶

The central concept in the common-law approach to agency is authority. As one Canadian scholar has stated,

The question of the authority of an agent is at the very core of agency. It is complex and difficult, but it must be understood, if the nature of agency is to be comprehended.¹¹⁷

Authority is perhaps most easily understood as a special kind of legal power held by an agent, a power to perform some act which affects the principal's legal relations. In cases where that power is voluntarily conferred by the principal to her agent, the agent is said to be "authorized" to act on the principal's behalf.¹¹⁸ Although consent is the paradigmatic mechanism by which authority is conferred, in some cases, an agent will obtain the power to affect the principal's legal relations without her consent. In such cases, the agency relationship is not the result of the unilateral manifestation by the principal of a willingness to have his legal position changed by the agent. Rather, it is the result of the application of the common law principle of estoppel. Fridman characterizes the application of estoppel as follows.

115. F.M.B. Reynolds, *Bowstead & Reynolds on Agency*, 16th ed. (London: Sweet and Maxwell, 1996) at 8 (emphasis added).

116. Keeping in mind the fact that such a transaction might be further complicated by the use of an electronic device on the other end as well.

117. G.H.L. Fridman, *Fridman's Law of Agency*, 6th ed. (London: Butterworths, 1990) at 15.

118. See Bowstead & Reynolds, *supra* note 115 at 6.

[A] person who, by words or conduct, has allowed another to appear to the outside world to be his agent, with the result that third parties deal with him as his agent, cannot afterwards repudiate this apparent agency, if to do so would cause injury to third parties; he is treated as being in the same position as if he had, in fact, authorised the agent to act in the way he has done.¹¹⁹

The fact that authority can, in some instances, be conferred in the absence of a manifestation of consent demonstrates that the agency relationship may result simply as an operation of law. Authority that is the result of a principal's consent is often referred to as "actual authority", whereas authority said to result from an operation of law, in this case the rule of estoppel, is often referred to as "apparent authority" (sometimes: "ostensible authority").

Applying the first of these two types of authority to automated electronic commerce, the person initiating an electronic agent might voluntarily confer a power by the unilateral manifestation of a willingness to have her legal position changed through the operations of the electronic agent. This power shift would permit the operations of an electronic agent to alter the legal position of that person. The fact that the electronic agent is not a legal person or that it does not have the capacity to contract is not relevant to the agency analysis. This is an important feature of the agency approach. According to the common law, juristic capacity is not required, in order for an agent to bind its principal. For example, minors and other entities with limited or no capacity to contract on their own behalf are competent to contract as agents.¹²⁰ Thus, all that matters in the electronic commerce context is that the person initiating the electronic agent had, in fact, consented to the operations performed by it. If a willingness to have her legal position changed through the operations of the electronic agent has been made manifest or is implied by the circumstances, one might say that the electronic agent has an 'actual authority' to operate on behalf of the person who initiated its use.

The second type of authority can also be applied to automated electronic commerce. In some instances, the person initiating an electronic agent will make things appear to the outside world as though the electronic agent is operating under her authority. In situations where a representation is made which causes it to appear as though a person has initiated an electronic agent to operate on her behalf and another person relies on the representation in a manner that results in the alteration of his position, the person initiating the

119. Fridman, *supra* note 117 at 99.

120. *Smally v. Smally* (1700) 1 Eq. Ca. Abr. 6; Bowstead & Reynolds, *supra* note 115 at 41.

electronic agent effectively confers a power which allows the electronic agent to alter her legal position. On the basis of the estoppel principle, this is true, even if that person has not voluntarily conferred a power to the electronic agent. To describe this process in the language of agency, one might say that the electronic agent has an ‘apparent authority’ (‘ostensible authority’) to act on behalf of the person who initiated its use.

The crucial feature of the authority concept, as applied to electronic commerce, is that it can be used to set limits on the liability of persons utilizing electronic agents. In other words, authority can be used in conjunction with an attribution rule to set parameters that will help to determine when a person is liable for transactions generated by her electronic agent and when she is not. Rather than using the more crude instrument of absolute liability, the application of agency law would allow courts to make more balanced assessments of who should be held liable for the operations (or mis-operations) of automated software. Essentially, a person will not be liable for transactions generated by her electronic agent, where its operations have exceeded her consent. Likewise, she will not be liable in situations where its operations did not result in representations that allowed it to appear to the outside world as though the electronic agent was operating on her behalf.

Since electronic agents are programmed, it is safe to say that there will be no occasions in electronic commerce where the authority of an electronic agent is conferred in such ambiguous terms or where the instructions are so uncertain as to be capable of more than one construction. Consequently, there is no need, in electronic commerce, to determine whether an electronic agent is said to have acted “reasonably” or “in good faith”.¹²¹ However, as the technology becomes more refined, one might expect issues to arise in the context of whether an electronic agent has operated in excess of its implied actual authority when it functioned in a particular manner, so as to execute the instructions of the person who initiated its use. For example, assume that an electronic agent is authorized to buy certain shares in a corporation. If so, the electronic agent would also have the implied authority to operate within the scope of that which is necessary in the usual course of business to complete the transaction.¹²² Is the electronic agent authorized to open a line of credit, in order to pay for the shares? What if the electronic agent arranged the line of credit through an illegitimate lender? Given that intelligent agents might

121. That is, the internal aspects of the agency relationship (i.e., the relationship between the principal and agent) are not relevant to electronic commerce.

122. This example is, in part, borrowed from Bowstead & Reynolds, *supra* note 115 at 118.

one day soon do business in a completely unpredictable and unconventional manner, the scope of that which is “necessary in the usual course of business to complete the transaction” might undergo a radical shift. Part of the problem, as highlighted above, is that the operations of intelligent agents will not always be dictated by those who program them. Though it may sound strange, the electronic agents of tomorrow could well learn for themselves what is necessary in the usual course of business to complete the transaction.

Another authority issue that could become problematic is whether and when an electronic agent may delegate its authority to an electronic sub-agent and, if so, to what extent will the person who initiated the original electronic agent be held responsible for the operations of the electronic sub-agent to which a task was delegated. As illustrated in some of the examples provided above in Part 3, the technologies of tomorrow will likely incorporate intelligent agent systems that operate in a collaborative manner across an open, interoperable platform. It is quite likely that, when people authorize electronic agents to undertake complex transactions, they will do so without knowing that electronic agents will delegate portions of the task at hand to other sub-agents. Sub-agency problems could arise, if the delegated electronic agents engage in transactions that are not sufficiently related to the task, as conceived by the person who initiated the original electronic agent.

7. Conclusion

One of the central points that has been articulated in this article is that the software which automates electronic commerce will soon be able to animate it. Electronic agents will cease being mere conduits of communication. They will soon begin to look and feel more like commercial intermediaries than like mechanical instruments. And as they do, it will become more and more difficult to determine how the law should treat them.

In this article, it has been suggested that the common law can and does accommodate for intermediaries in a transaction, even where those intermediaries are said to lack the juristic capacity to contract for themselves. Consequently, an absolute attribution rule that considers the operations of an electronic agent to be the acts of the person using it is not the only available option. In the context of the proposed electronic commerce regimes, the question becomes one of limitation. If it is incorrect or unjust to always attribute the operations of an intermediary to the person who employs it, what mechanism is most adequately suited for delimiting the appropriate bounds of contractual liability?

As is the case with human intermediaries, when an electronic agent makes manifest something other than what the person using it would have manifested had she or he reviewed the proposed transaction, it is unclear whether it can truly be said that there has been a “manifestation of assent”, so as to bind the human originator. If it were a person and not a piece of software playing the role of intermediary, the law of agency would require that we look either to the intentions of the principal or else to the representations made by the principal to the third party, to see whether there was, indeed, a manifestation of assent. But, according to the majority of proposed electronic commerce regimes, we need not bother with any such investigation in the case of agent-mediated electronic commerce. With the exception of *UCITA*, the proposed attribution rules generally provide that anything made manifest by an electronic agent will be attributed to the person using it. It has been suggested in this article that such a rule is too removed from traditional legal principles and would not promote or foster the development of electronic commerce.

Consequently, drafters of electronic commerce legislation should carefully consider the way that our law treats other intermediaries. It is suggested that *UCITA*'s choice to incorporate the law of agency is a promising starting point from which one can begin to develop the appropriate set of limiting principles to accompany an attribution rule of the sort found in most of the proposed and enacted legislation. Although electronic agents might not yet appear to be sufficiently “intelligent” to require an application of agency law, the promise of agent technology will likely make an application of the law of intermediaries necessary in the near future. An application of the external aspects of agency law would furnish a useful set of limiting principles which could operate in conjunction with fundamental principles of contract law to help determine whether there has, in fact, been a manifestation of assent in particular electronic transactions.