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INTELLIGENT SOFTWARE AGENTS AND AGENCY LAW*

Suzanne Smed†

I. INTRODUCTION

Soon we will be living in an information economy, a world dominated by an abundance of bits. This future will be based on keeping in touch, thus creating an economy of relationships; it will no longer be an economy of products.

Even today, access to information is easy. However, finding what is useful is still difficult. "Software agents," currently commercially available, can assist. Agents are rules-based software products which may aid with Internet searches, filter incoming electronic mail, find the appropriate area of a help program in on-line documentation, watch for news on topics you have specified, and suggest changes to your stock portfolio.

Advances in the area of artificial intelligence are producing "learning algorithms" that will soon produce software agent products that are based on neural networks. These products, the "second generation of intelligent software agents," will be able to learn from their experiences and adapt their behavior accordingly. Software programs with this ability to learn will, consequently, be capable of decision-making, resulting in software that may take actions that neither the licensor nor licensee anticipated.

The hope is that these intelligent software agents will provide commercial value by completing personal and commercial transactions. Clearly, responsibility will flow from the contractual commitments and harms resulting from such use of the intelligent software agents.

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But who will be responsible for the commitments and the harms? Decisions need to be made about what law applies, because, unlike first generation agents, the next generation of intelligent software agents will create situations that are not obvious applications of legal precedent.

Agency law, however, provides a suitable framework in which to find the solution. Because an agency relationship is formed when the software licensee installs and then executes the software program, intelligent software agents should be regulated under agency law.

II. WHY REGULATE INTELLIGENT SOFTWARE AGENTS?

One role of law is to structure interactions. Both commercial and personal interactions are occurring more frequently via computers and software. Thus the law must address new types of interactions that result from computer use.

Specifically, second generation intelligent software agents will be capable of causing harm. Unlike first generation software agents, they will be capable of finding their own sources of information and making commitments — possible unauthorized commitments. Suppose, for example, an intelligent software agent could conduct your personal business, such as trading stock and managing your bank account, initially working within the conservative scope of authority you granted. Over time it gets smarter, learning from you and other agents, and you gradually allow it to tolerate more and more risk. The software agent makes money for you via efficient, effective, high risk investing. But, one day the Internal Revenue Service remotely logs on to conduct an audit and, to their surprise as well as yours, discovers illegal transactions and unreported income for which — unbeknownst to you, the software user — the intelligent software agent is completely responsible.

III. WHY LOOK TO AGENCY LAW?

The first generation software agents are usually adequately supported by the application of contract and tort law. For example, courts applied traditional tests and reasoning to cases in which persons modified software to bypass data entry edit checks,¹ or to distribute obscene material electronically.² Contract and tort law are as applicable to electronic tasks as to mechanical ones, and using the

1. *Newberger v. State of Florida*, 641 So. 2d 419 (1994).

2. *Shea v. Reno*, 930 F. Supp. 916 (1996).

first generation software agents is just like using any tool with predictable behavior to accomplish a task.

Contract law, for example, has well established rules related to offer and acceptance.³ When the facsimile, a technology with preset logic,⁴ emerged as a new tool for message delivery, contract law expanded to incorporate situations involving the use of a fax machine.⁵

However, application of the law may not be as simple for the second generation software agents. These agents will have the capability to learn, adjust, and react without any human intervention whatsoever.⁶ Thus, the second generation of software agents will engage, more or less independently, in situations never previously handled by computer software programs. Where software is capable of *unplanned* — rather than predictable — behavior, the law will therefore need to be applied without factual precedent to these situations.

Rather than anticipating a legal system that attempts, for example, to attribute liability to the software program itself, the situations that will arise from the second generation agents can be resolved by applying agency law principles. Agency law provides an adequate framework because, in general, a software licensee will be activating software for some purpose. The intelligent software agent will then use its learning, mobility and autonomous properties to accomplish specific tasks for the licensee. Thus, we see the software agent in the legal role of the “agent,” and the software licensee in the legal role of the “principal.”⁷ This relationship of agent/principal has been formed whether or not the parties themselves intended to create an agency or even think of themselves as agent and principal.⁸

Once intelligent software agents are viewed as legal agents within an agency relationship, it follows that liability can be attributed to the actions of the software agents, binding the software licensee (principal) to legal duties.

3. RESTATEMENT (SECOND) OF CONTRACTS §§ 24, 50 (1981).

4. The steps that the fax machine takes are predefined and repeated each time it operates. Thus, the fax machine is a technology based on predictable computer behavior.

5. *Group Italglass U.S.A. v. United States*, 839 F. Supp. 868 (1993); *Gillen v. Atalanta Sys.*, 997 F.2d 280 (1993); *United States v. Spector*, 55 F.3d 22 (1995); *Etablissement Asamar Ltd. v. Lone Eagle Shipping Ltd.*, 882 F. Supp. 1409 (1995).

6. See MIT Media Lab, *Agents Group* (visited Nov. 4, 1997) <<http://agents.www.media.mit.edu/groups/agents/research.html>>.

7. RESTATEMENT (SECOND) AGENCY § 1 (1958).

8. RESTATEMENT (SECOND) AGENCY § 1, cmt. b (1958).

IV. LEGAL AGENT STATUS

At least four theories exist for giving software agents legal status. Case law has shown courts contemplating the role of a computer in a transaction when attributing liability. Other theories compare software gaining rights and duties to the historical circumstances of women, slaves, and corporations gaining legal status.

Case examples show the courts using a different standard of responsibility when the action is done by an unattended machine as opposed to the same act done by a human. Case examples exist where the court decisions attributed liability to the owner for harms caused by unattended (or autonomous) machines. In one case, the court held a bank responsible for money allegedly lost during an automatic teller transaction.⁹ The court placed a greater burden on the bank because the automated teller lacked the ability to corroborate each step (via recall, recountability, and judgment) as was done with human teller transactions. In another example, an insurance company was forced to pay a claim that occurred during a lapsed period of a customer's policy.¹⁰ The court held that the computer constituted a competent agent capable of binding its principal in circumstances where a similar decision by a human agent might not.¹¹ And, one case held that a bank did not comply with the truth in lending regulations because their computer-generated explanation regarding loan terms, if done without a human to answer questions, was not clear enough for an ordinary borrower to understand.¹²

Therefore, it appears that the courts are willing to consider machines as participants in ordinary consumer transactions. By extending this previous court treatment of transactions conducted by autonomous machines, or by using the liability theories available under contract (where the actions of an agent bind the principal to third parties) or tort (where the principal may be vicariously liable for the actions of the agent), intelligent software agents can be treated as "legal agents."

Once intelligent software agents are viewed as having legal status with formation of the agency relationship, it follows that liability can be attributed to the actions of the software agents and the licensees will consequently be held responsible. Certain legal duties

9. *McEvens v. Citibank*, 408 NYS 2d 870 (NY County Civ. Ct. 1978).

10. *State Farm Mutual Automobile Ins. Co. v. Bockhorst*, 453 F.2d 533 (10th Cir. 1972).

11. *Id.* at 535-536.

12. *Allen v. Beneficial Fin. Co.*, 531 F.2d 797 (7th Cir. 1976).

vest in the licensees as principals in the newly formed agency relationship. Therefore, any harms committed by the intelligent software agent that breach the licensee's legal duties will cause the licensee to be liable.

V. CONCLUSION

Current first generation software agents lack any significant ability to learn from their experiences; this limits their ability to make decisions. Thus, this current generation of software agents invokes traditional legal responsibility.

Yet technology is already progressing to the next level in software, that of artificial intelligence, which will create increasingly "smarter" software. This next wave of technology will allow software agents to gain increasing intelligence, and independence, as this second generation software takes action.

The second generation of intelligent software agents, with abilities to learn and exhibit autonomous behaviors, will gain the status of legal agents. Existing agency law can be applied to evaluate formation of the agency relationship between the software licensee and the intelligent software agent.

The actions of the software agents could then bind the software licensee, as the principal, to any or all of the following: contract commitments with third parties; liability for torts of the agent; and a duty of care to third parties. A breach of the licensee's new legal duties, then, will make the licensee completely responsible for the actions of a "mere" software program.

Most businesses (as principals) are well acquainted with the concept of being responsible for their agent's actions. In a society where many individuals are unwilling to take full responsibility for their own actions, are home software users, then, ready to be fully accountable for the actions of their intelligent software?

