

Software Agents and Contracts

S

Francisco Andrade

Universidade do Minho, Portugal

Paulo Novais

Universidade do Minho, Portugal

José Neves

Universidade do Minho, Portugal

INTRODUCTION

In the current economical context, characterized by the existence of a global society, the access to information is crucial for any economical and social development; yet, important technological challenges still remain. The representation, maintenance, and querying of information is a central part of this problem. How can we obtain the adequate information at the adequate time? How can we supply the correct items for the correct people at the correct time? How and where can we get the relevant information for a good decision-making? The organizations focus their competences in strategic areas and have recourse to external supplies, cooperating with sporadic partners, with the objective of reducing costs, risks, and technological faults or maximizing benefits and business opportunities. One of the most radical and spectacular changes is the information dematerialization, the procedure automation, the recourse to decision support systems or intelligent systems, and to new forms of celebrating contracts (e.g., is it possible to practice commercial acts and celebrate deals using autonomous and pro-active computational agents?). The virtual organizations face new challenges and there must be a search for new answers to old questions. The negotiation processes through electronic means and the e-commerce platforms may set new forms of contracts, with engagements and negotiations among virtual entities.

Software agents are computational entities with a rich knowledge component, having sophisticated properties such as planning ability, reactivity, learning, cooperation, communication, and the possibility of argumentation. The use of the agent figure is particularly adequate to such problems. The objective is to build logical and computational models, as well as implementing them, having in consideration the law norms (i.e., legislation, doctrine, and jurisprudence).

Agent societies may mirror a great variety of human societies, such as commercial societies with emphasis to behavioral patterns, or even more complex ones, with pre-defined roles of engagement, obligations, contractual, and specific communication rules.

To begin with, it must be said that under western legal systems, computers totally lack legal personality (i.e., the possibility of being subjects of rights and obligations, of expressing a valid and binding will, of being liable for their own actions). However, intelligent artefacts are not only capable of acting according to its in-built knowledge and rules, but prove to be capable to learn from experience, modify its own states of knowledge, in particular according to cognitive, reactive and pro-active processes quite similar to those of the human beings.

Of course, the consideration of such behaviours and their role--the role of the computer is rapidly evolving from that of passive cipher to that of active participant in the trading process--operates a radical shift in the way we understand basic legal questions such as will and declaration, or the means of manifesting a will in order to get legal effects produced (Portuguese Civil Code, art. 217°), which leads us to an imperious need of analyzing the question of expression of consent in itself. And two main possibilities have been analyzed: the possibility of considering the electronic devices as mere machines or tools, used by its owner and the daring possibility of considering the electronic device as a legal person.

LEGAL CONSIDERATION OF SOFTWARE AGENTS

One possibility would be to consider the whole declarative process as indeed performed by a human. It would be like establishing a legal presumption that—Allen

and Widdison call it a “legal fiction”! (1996, p. 43) —“all transactions entered into by the computer would be treated as transactions entered into by the human trader,” thus putting the intention and the whole risk for the transactions “on the person best able to control them--those who program and control the computer” (Allenet al., 1996, p. 46, 49). This “fiction,” based in a presumption that a person assents to a declaration or to a contract, even though he may not be aware that something was declared or that a contract was celebrated, would perfectly comply with the USA’s UCITA regime (and intention), as it was pointed out by Jean-François Lerouge: “if a party creates a situation in which an electronic agent is to act on his behalf, then a party is bound by the actions of the “agents” (Lerouge, 2000). In this regard, Weitzenboeck speaks of attribution: “the operations of an intelligent agent are attributed to the human who uses the agent” (Weitzenboeck, 2001). That is to say that this theory recognizing that the only valid and relevant consent must be the one of the person on whose behalf the agent acts, a connection must thus be established between the action (non-human) and the intention (human), in a similar way to what appears to be a conclusive behaviour of the declarer in automatic inter-systemic electronic communications, such as EDI: “ by initiating the electronic agent, the user is deemed to have accepted that contracts concluded by the agent will be binding on such user. The assent of the electronic agent will be inferred to be the assent of the (human) user of the agent” (Weitzenboeck, 2001). The acceptance of this theory would have an obvious impact--the risk of transactions would entirely be put “on the persons who program, control, or otherwise use an electronic agent” (Weitzenboeck, 2001) and these would eventually be assigned a sort of liability regime similar to the one relating to the use of cars or machines by the owner. “A party may be liable for a damage caused by an object.” It is a well-known principle of Civil Law’s liability regime that “a person to whose sphere machines can be assigned to is supposed to be liable for them. Thus, the one shall bear the risk that has the right and ability to control the machine and receives a (financial) benefit from its use” (Haentjens, 2002).

But wouldn’t it be a terrible burden to put on programmers and users—who surely would not be “in such a condition to anticipate the contractual behaviour of the agent in all possible circumstances” and so would not be in position of “wanting” each and every “contract which the agent will conclude”? (Sartor, 2002)

Although this theory of considering electronic agents as a mere machines or tools is the most well accepted by legal authors, and besides it was contemplated by the US and Canada legislation, the truth is that some authors have been looking for other possible solutions, and the daring possibility of considering software agents as legal persons has been considered.

In order to evaluate the chances of attributing a legal personality to intelligent software agents, it might be interesting to analyze—establishing some due comparisons—the arguments that justified the consideration of corporate bodies as legal persons (Cunha, 1929).

In fact, legal persons are to be seen as a technical reality or instrument at the service of the law, through which it has achieved a way of dealing with certain human interests (Fernandes, 1996). Legal persons are thus considered a reality of the legal world corresponding to a social need, to a social interest worth of being dealt with, according to the law. Applying such considerations to intelligent software agents, it may be argued that those are physical and logical entities capable of multiple and autonomous intervention in the legal world, whose personification under the law might be foreseen as a technical way of responding to a social need—the need for more efficient and reliable ways of undertaking actions that man alone can not perform, or can not perform sufficiently and economically and in time.

Besides a own will, two basic requirements were enounced as needed for a corporate body to become a personality, and those were substratum (e.g., personal or patrimonial component, teleological component, intentional component) and recognition (Andrade, 1974). Does substratum exist in software agents? Can we consider its physical and logical structures as a personal or patrimonial element? Can we speak of teleological and intentional elements when referring to software? And how could recognition of legal personality to software substratum be handled?

The attribution of legal personality to intelligent software agents would have some obvious advantages: it would solve the question of consent and the validity of declarations and contracts enacted or concluded by software agents (Felliu, 2001); and it would reassure the owners-users of the agents about eventual liability concerns (Sartor, 2002). But it would also face several difficulties due to the intrinsic characteristics of software agents—some difficult problems could arise relating to questions such as domicile (Miglio, Onida, Romano, & Santoro, 2002) or patrimony (Weitzenboeck, 2001).

5 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/software-agents-contracts/17783

Related Content

The Role of Technology in Supporting Communities of Practice

Alton Chua (2006). *Encyclopedia of Communities of Practice in Information and Knowledge Management* (pp. 447-452).

www.irma-international.org/chapter/role-technology-supporting-communities-practice/10529

Virtual Evidence in the Courtroom

Damian Schofield (2012). *Handbook of Research on Practices and Outcomes in Virtual Worlds and Environments* (pp. 200-216).

www.irma-international.org/chapter/virtual-evidence-courtroom/55902

Sustainability Reporting in the Metaverse: A Multi-Sectoral Analysis

Sunaina Rathore and Manpreet Arora (2024). *Exploring the Use of Metaverse in Business and Education* (pp. 147-165).

www.irma-international.org/chapter/sustainability-reporting-in-the-metaverse/343979

From the Digitization of Building Materials to Their Use in BIM Models on an Open Standard Platform: The eBIM Project and Its Applications

Chiara Vernizzi and Roberto Mazzi (2022). *Handbook of Research on Implementing Digital Reality and Interactive Technologies to Achieve Society 5.0* (pp. 222-250).

www.irma-international.org/chapter/from-the-digitization-of-building-materials-to-their-use-in-bim-models-on-an-open-standard-platform/311756

The Role of Mechanics in Gamification: An Interdisciplinary Perspective

Miralem Helmeffalk, Siw Lundqvist and Leif Marcusson (2019). *International Journal of Virtual and Augmented Reality* (pp. 18-41).

www.irma-international.org/article/the-role-of-mechanics-in-gamification/228944