Intelligent Agents and Their Legal Status

■ by *Emre BAYAMLIOĞLU**

*An Essay on Artificial Intelligence and Personality***

I- The Concept of Intelligent Agents[1] and Their Economic and Social Features

Improvements in computer, communication and software technologies have stimulated systems that assume manpower functions online or independently. These "intelligent agents" are used for complex and large-scale information searches, data organization and electronic business transaction functions. These machines[2] in question can be directly programmed to perform a particular function without any human intervention so that they can develop relevant reactions in accordance with the signals from the external world or communication networks. The most eminent feature of such software is to display interactions and purposive acts independent from the user.[3]

Some of their features can be listed as a) acting purposely without any direct instruction from the user; b) communicating with other sources of information; c) cooperating with other units or entities in order to attain a target result, d) adapting based on previous acts (the method of trial and error), e) reliability[4]

For instance, in e-business transactions performed by a computer software program, it could be possible to automate the creation of a contract between a consumer and dealer. Electronic polling, online meetings and procedures have already been authorized in corporate law. Legal and executive governance actions regarding banking transactions and information security require a high-level of technical advancement in the intelligent agents used in the sector. Banking transactions, as well as legal and administrative controls on the security of information, also require in-depth technical information on intelligent agents being used in this sector. Intelligent agents may accomplish functions such as optimization of resources, monitoring of work flow and even conducting negotiations. The intelligent agents used in almost all fields today, such as customs legislation, tax return preparation, invoicing, prohibition of copyright[5] violations and even

*** PhD, Bilgi University, Lecturer at Commercial Law.**
emreb@bilgi.edu.tr
** Initial version of this article has been translated by Ms. Duygu Düzgün, graduate of Bilkent University, American Literature.

[1] Intelligent agents, also known as "expert systems" in computer sciences, are defined as advisor programs aimed at imitating an expert's knowledge for the solution of specialized problems.
[2] The terms "machines, "computer," "system," and "robot" are used for defining the software or the compound of the hardware and the software for the purposes of ease of expression.
[3] LEGAL-IST Consortium , *Report on Legal Issues of Software Agents*, IST-2-004252-SSA Rev. 2 Issue Date: 29/03/2006, s.12
[4] Schafer B. '*It's Not Just Cricket - RoboCup and Fair Dealing in Contract'* (2003) in Proceedings of the 2nd Workshop on the Law and Electronic Agents, LEA 2003 (Oskamp A. & Weitzenbock E http://www.iids.org/projectfolder/alias/events/ProgramLEA2003.htm/lea2003/; J Groom, "*Are 'Agent' Exclusion Clauses a Legitimate Application of the EU Database Directive?",* chapter. 2.1 (2004) 1:1 *SCRIPT-ed* 83, @: from <http://www.law.ed.ac.uk/ahrb/script-ed/docs/agents.asp>
[5] Although the term "copyright" is not technically appropriate, it has been preferred in lieu of the term "the right of the owner of the work" for reader-friendly purposes.

election polls, mean new areas of research and problems for all disciplines of law. From the standpoint of public law, even only the issues under the concept of the e-state are sufficient enough to emphasize their significance with respect to administrative law and fundamental rights. All these concerns constitute only a small part of the relationship between computer software and the science of law, which is going to improve far more in the future.

While intelligent agents diffuse into new areas that concern all fields of law and assume more complex functions, it appears that they do not have any status merely beyond being a "commodity" or a piece of intellectual property in terms of positive legislations on their legal status. The use of intelligent agents becomes more and more widespread with each day as a phenomenon that must be handled by the science of law and all its branches within their own structure. Intelligent agents based on artificial intelligence, appear to be used as laborer software/machines assuming complex functions in the production process rather than as machines replacing humans. The legal problems pertaining to these systems assuming such intensive commercial and administrative functions, day-to-day, require having more and more information about the fundamental features of these systems and their operating principles. Turning this information into legal interpretation can only be recognition of the social dimension of the concepts of communication and information. Otherwise, the lawyer will have to accept the given data and results proposed by the system, yet will not be able to control and organize the hidden side of the operation of this system. A transparent and uniform organization is vital in order for intelligent agents to be subject to proper legal arrangement and audit.

In this study, some of the legal consequences which have been derived from the functions which intelligent agents have undertaken, their methods of operation and views stating that the most appropriate legal status for intelligent agents shall be discussed.

II- Three Legal Issues Regarding Intelligent Agents

A) Intelligent Agents Assuming Contract Negotiation Functions

Intelligent agents that contract on behalf of people is not a recent phenomenon. Vending machines selling drinks or cigarettes have long been familiar to us in our daily lives. Yet, intelligent agents are different from those machines in the sense that they not only assume an active role, but also take the initiative throughout the bargaining. In other words, they negotiate by themselves or call for tender. At this point, apart from mutual agreement within the framework of contract theory, it is possible to depend on the concept of unjust enrichment for the legal binding characteristic of these proceedings. Additionally, it is also possible, to a certain extent, to depend on good will[6].

Nevertheless, the contract cannot be reduced merely to the proceeding itself by thoroughly putting aside the socio-psychological aspects, such as will, motive, mistake and fault which constitute the fundamental elements of contract negotiations. In other words, the concept of statement of will, which is one of the most important re-

[6] Gunther Teubner, Rights of Non-humans? Electronic Agents and Animals as New Actors in Politics and Law, Journal of Law & Society 33, 2006, 497–521, s. 8

flections of the legal personality, cannot be perceived to be a mere "statement" abstracted from subjective elements[7]. Such an attitude will result in the futile non-resolution of legal problems. Although contract negotiations conducted by intelligent agents could be considered valid through some specific arrangements, such as the use of the UNCITRAL Convention[8], it is essential that the contracts negotiated by intelligent agents should be settled within a theoretical framework since it is impossible to rewrite the whole law of obligations in order to accommodate intelligent agents. [9] The contrary approach would cause a deadlock in resolution of the legal problems, especially ones that would arise in the event of mistake, because in the event of mistake, the physiological situation behind the statement should also be analyzed along with its actual formulation.

Briefly in this section, some questions are raised on machines' status in contracts conducted by intelligent agents, in the view of the formation of a contract. These questions, in a sense, embody some clues why intelligent agents may need to have a status like that of a person along with the status of being an agent.

It has been claimed that intelligent agents are an automated form of the programmer's will. Behind the automated processing of the machine lies the will of the person who has programmed it. Even though the proceedings conducted by intelligent agents are commonly accepted as legal, the machine's functions and their legal character have been a matter of less discussion. The first theory handles the software just like a telephone or a similar tool; this respect attributes no role other than transferring the contracting person's will to the software. However, intelligent agents, with each passing day, progress further as artificial intelligence applications, better learning to act autonomously and transforming experience into knowledge, and also learning to contract without the participation of, or instruction from, the person on whose behalf they proceed. This shows that accepting intelligent agents as only "property" is not in compliance with the characteristics of the functions which these systems perform. Should such an approach be accepted, then the mistakes which could occur during the contracting process due to the software shall only be regarded to the extent that the operator of the machine can depend on the grounds of "mistake" as regulated by the Law of Obligations. Although Article 27[10] of the Turkish Law of Obligations is a provision which softens this consequence to a certain extent, the wording "*..like a messenger or an interpreter..*" written in the text of the Article, makes it hard to assess these software applications or similar technological tools within the framework of this provision, which are claimed to be nothing more than a "property." Moreover, the mistakes which the software can cause are not limited to an "erroneous transfer" as stated in Article 27 of the Turkish Code of Obligations. Furthermore, it is also controversial whether the mistakes and faults which may occur in the software could be accepted as an invalidity of will, which would thereby affect the validity of the transaction, since the software would produce the "will" for the deal in question.[11]

Acceptance of intelligent agents as messengers is not a solid basis

[7] Fikret Eren, Borçlar Hukuku - Genel Hükümler, C.I., s.178-183, S Yayınları, Ankara, 1991

[8] United Nations Convention on the Use of Electronic Communications in International Contracts. New York, 23 November 2005.

[9] For further information see. Steffen Wettig ve Eberhard Zehendner "The Electronic Agent: A Legal Personality under German law?" *Proceedings of the Law and Electronic Agents Workshop,* (2003) s. 97–112 http://www.lea-online.net/publications/Paper_8_Wettig.pdf

[10] Turkish Code of Obligations, Article 27 – Mistake of an Agent: Should any of the parties' will is transferred wrongfullly by an agent such as an messenger or interpreter, the circumstance shall be evaluated in compliance with provisions regulating mistake.

[11] Additionally, Teubner, at pg.11, states that "*according to German law, the calculation error of the software does not cause the occurrence of a right to withdraw from the contract; nevertheless, the mistakes made by the software in transfer of information would raise such a right*"

to evaluate the faults in the formation of the contract. The mistakes which the messenger can make will only be accepted to be within the content of the Article 27 of the Code of Obligations if they are mistakes in the transfer of information, since the messenger performs only a communication function.

As is known, mistakes take place due to a miscoordination between the person's consciousness and the facts of the outside world. Computer errors, other than those that occurred, arising from individuals, are considered to be force majeur by some jurists.[12] Some other defends that the operator of the intelligent agent should at any circumstance, be bound by the contract under the terms of " absolute liability" .

Nonetheless, another option is to consider the intelligent agent to be an "agent" in terms of creating a contract by assigning a personality-like status to it. The most important reason for this is that the intelligent agent can act autonomously. In this way, some of the mental circumstances which the law regulates for the "person," and which are considered to be a mistake, can be tailored to the operation of the intelligent agents. Accordingly, the user of the intelligent agent would be able to have the right to claim the invalidity of the contract on the ground of relevant provisions, just as for contracts created by his agent.

Since in a autonomic system there are no pre-defined parameters which completely restrict the behavior of the system, it is not possible to state that the transactions performed by systems are the result of the will of the person of whose behalf the system is acting.[13]

If intelligent agents are merely accepted as property, the contracts conducted by them would bear more risks than the ones created by an agent. First, the users or the operators of the intelligent agents will have to take precautions to ensure the complete and rightful performance of the system at all times. Accordingly, since the machine is not a person itself, the malfunctions in its operations shall not be considered to be one of the states of mistake regulated by the Law of Obligations.[14] For this reason, considering the intelligent agents to be legal persons would be a more efficient solution than reforming the concepts of agency and attorneyship, as well as the principles of forming contracts as regulated by the law of obligations.

B) Intelligent agents and the Determination of the Legal Liability

Software is programmed on the basis of a particular rational purpose and a logical system, which accounts for the supposition that the system acts rationally in compliance with its own purposes. The cognitive structure of the machine is a mechanism that processes preferences and priorities, resolved in the course of programming, in coordination with the given data. Intelligent agents can cause considerable damage within the framework of the functions they are carrying out. In this respect, the first option that comes to mind would be either to hold the user, the proprietor or the programmer responsible for compensation of the damages. Another option that is going to be discussed herein is to assign the intelligent agent a liability like a legal personality.

[12] Ibid.
[13] Ibid at 10.
[14] See also Emily M. Weitzenboeck, *Electronic Agents and the Performance of Contracts*, International Journal of Law and Information Technology, Vol. 9 No:3, 2001, 204-234, s.218-221., for the different theoretical grounds in the Anglo-Saxon and Continental law systems.

It can be presupposed that the user of the software, like an employer, trusts the cognitive capability of the intelligent agent software and thus accepts the risks of the consequences. In addition to this, analogies to the provisions regulating the liabilities of the building owner and the possessor of animals could also be considered. Nonetheless, it is impossible to directly use these concepts as appropriate models for intelligent agents without making serious revisions. Furthermore, the question of how the user of the intelligent agent may bring up evidence of innocence is still a problem which has not been solved yet. Under what conditions will the user be considered to have been thoroughly cautious? Besides, it should be stated that systematic malfunctions affecting the Internet to a great extent or even large-scale virus attacks should also be considered to be force majeur events.

In contrast to the physical world, comparing the legal obligations of intelligent agents under the Law of Obligations with those of institutions is difficult because of the independency of proceedings, acts and situations from time and place. Therefore it is not easy to apply the theory of "causality" in such cases. Consequently, the liability of the user of the intelligent agent becomes considerably bound by the technical classifications and interpretation, since the decentralized and diffused structure of the intelligent agent does not allow a real application of the theory of physical causality.[15] Due to the fact that the decision shall be a question of interpretation, and even a question of preference in most of the cases, the principle of evaluating every case based on its own circumstances may become absurd. The complex structure of intelligent agents that is formed of components combined to each other, provides a wide flexibility of interpretation on causality, which cannot be seen in the physical world.

Another party to be held responsible for the damage is the programmer. Nevertheless, to what extent the programmer might predict the software's behavior is a matter for debate. It is impossible to know all the possible situations a software program, which has the ability to act autonomously, could create. Moreover, the producer firms may limit or abolish their liabilities when contracting with the user, but the state of absolute liability regarding "product liability" may still be applied as long as the software is considered to be a product rather than a service.[16]

As can be seen, assigning intelligent agents a status like that of a person could also be a means to solve the problems of responsibility regarding its operation. What makes it hard to recognize these systems, which we sometimes call intelligent agents or "machines," as subjects of property rights is their *sui generis* features. Paying attention to the developments in Internet speed and applications, it becomes more and more difficult each day to distinguish the intelligent agents from hardware elements or to associate them with a particular place and time. Different parts of the system operate in different hardware, which results in a distributed and decentralized structure. Therefore, it is impossible to associate intelligent agents directly with a person or place and it is also ambiguous to designate to whom the malfunctions in decentralized processes could exactly be attributed.[17] Assigning in-

[15] LEGAL-IST Consortium , *Report on Legal Issues of Software Agents,* See Pgs.82-83.
[16] See. EU Council Directive on Product Liability numbered 85/374/EEC
[17] Weitzenboeck, at Pg. 213

telligent agents a personal status would, first, allow them to have private assets, eliminating some of the problems concerning the liability, as explained above.[18]

C) Contents and Databases Constructed by Intelligent Agents

Another aspect of the discussion over the legal status of intelligent agents is how databases and other content they compose should be assessed in terms of intellectual property. For instance, software that collects and categorizes Internet news to form a database as well as to create summary texts, could be subject of copyright claims. In view of the present legal situation, the intellectual property rights over such items belong to the operator using and operating the software for commercial or other purposes. In other words, the operator giving the necessary instructions to the system for a particular purpose is legally recognized as the copyright claimant for the content emerging at the end of the process. The assumption here is that the operating software is partially a matter of intellectual activity. However, protecting an idea or a work of art created by software on the basis of copyright law shall become more and more discussed as computer skills to apprehend and use human language improve.[19] Many economic and legal reasons why the visual, audio and written materials made up by software cannot be protected within the framework of the present intellectual property rights can be raised, given what the robotic and genetic technology promises for the near future may be. Think about a person who has programmed and started to operate music software loaded with various tones and harmonic forms. Can he be regarded as having a musician slave composing pieces for him? AARON, [20] a type of painting software, is another example. The output of this software, which each time makes up pictures that are completely different and legally original, technically has all the qualifications essential to copyright protection.

Taking into consideration that such systems are distributed and decentralized, it may not be easy to designate who gives the subject commands to the software, and at this point, the conflict of different interests would be almost inevitable.[21]

Another intelligent agent output to be protected is databases, which have a significant scope of application at present. Owing to their differences from copyright protection, databases are subject to a different protection regime, called the "*sui generis* right" under a special directive in EU Law.[22]

Databases that provide information for consumer preferences are especially vital for marketing and designing new services. Different from copyright protection, the protection on a database is not only for the creative style and form but also for the data content.[23] The output information does not necessarily need to involve creativity in terms of the database protection, which does not rely on the aesthetic and scientific qualities.[24] Such legal provisions in Turkish Law that resemble the EU Directive are contained in the Additional Clause 8 that was inserted into the Code of Intellectual Property by Law No. 5101, according to which *the database producer who qualitatively or quantitatively invests in composing, verifying or presenting a database on a*

[18] In terms of compensation, the same result can be achieved through regulation of required insurance.

[19] Kathy Bowrey, *Copyright, Photography & Computer Works -Tthe Fiction of an Original Expression,* University of New South Wales Law Journal (1995) 18:2 p. 278-299

[20] http://www.kurzweilcyberart.com/aaron/ .

[21] Similar discussions took place when photography first appeared. Whether a photograph is the work of the person creating the composition or it belongs to the person that pushes the shutter release. See the US case, *Melville v Mirror of Life* [1895] 2 Ch. 531.

[22] Directive 96/9/EC OJ L 077, 27.03.1996 P.0020-0028.

[23] A directive is defined in Article 1 / 2 as independent art piece, information or *situations* that are methodologically or systematically arranged and could be accessed in electronic or other media. As is clear from the definition, any information can be a content for databases. See Uğur Çolak, *Topluluk ve Türk Hukuku'nda Veri Tabanlarına Sağlanan Sui Generis Koruma ve Spinn-Off Teori*, Ankara Barosu Fikrî Mülkiyet ve Rekabet Hukuku Dergisi, 2005, V.5, # 1, p.25

[24] In the case of original situation in choosing and pairing up of databases, which are original databases under compilation protection, copyright protection is possible just for this choice (See Code of Intellectual Property (FSEK) Article 6/11 and 1/B(d).

significant proportion benefits from legal protection.

For instance, there is only one correct database that includes four-star hotels in Istanbul and no matter who prepares it, the correct database will consist of the same content. Here, a personal style is out of question since there is only one correct database regardless of any aesthetic and scientific content to be protected.

The role of computer and data processing technologies in making up databases cannot be denied. Databases can be much more effective tools once they are improved and operated by computers since they lack creativity and have a comprehensive structure. A great portion of databases, which benefit from the *sui generis* right protection, are partially generated and operated by software; since the commercial value of such databases come from their ability to embody comprehensive information and quickly categorize this information in an effective and detailed way, this could best achieved by intelligent agents.

The need to reconsider the regulations regarding the content produced by software, especially regarding databases, arises at this point. Systems which the software companies are working on are of such a complex nature that it would cause a problem for these systems' content to be considered to be property. There already exists competing approaches to this issue, one of which suggests that databases should be subject to registration just like trademarks and patent.[25] On the other hand, since the subject databases depend on capital components, such as software and hardware rather than intellectual activity, it seems appropriate for the protection to be confined to a shorter time span, like that of a patent. Additionally, it might also be suggested that this protection over content, which has been created by the software, be limited to only being of a general nature without mentioning the moral rights at all.

All these account for some developments that will necessitate subjection of the content generated by the intelligent agents to a different protection regime; content created by intelligent agents will soon take its place in intellectual life as a different category of achievement. Avoiding the requirement to make a different kind of legal regulation will come to mean carrying copyright and *sui generis* database rights more forward than supposed before, which is certainly not compatible with the ideal of motivating science and art that underlies intellectual property protection.

Assigning intelligent agents a status resembling that of a person's will not only allow for a different protection regime but will also enable its implementation. Intelligent agents with the subject status might be a start in the sense of creating a different protection regime over their intellectual output. The limited protection over the content created by the intelligent agents will be specified to the system itself and this will make its administration easier within the personal status assigned to the system. As stated above, it is not possible to precisely determine and categorize all parties participating in the process of generating an intellectual product while the machines are involved in the process. Therefore, instead, incorporating intelligent agents as the

[25] See J. Lipton, *Private Rights and Public Policies: Reconceptualizing Property in Databases*, Berkeley Technology Law Journal 18(3), 2003, p.773-852.

rightful owners and allowing their shareholders to benefit economically, just as in companies, seems to be a more effective option.

III – Legal Personality as a Status – The Company Model

It is clear in the discussion over the legal status of software that this status should be a "legal personality".[26] The "company" form here appears to be appropriate for intelligent agents. Should the arguments above regarding the recognition of legal personality status for the intelligent agents be accepted, it is possible to incorporate intelligent agents with a company structure as regulated in commercial law. A company and a computer program are obviously quite different beings at first sight, but nonetheless a careful analysis may allow some analogies.

However, similar to computers, companies also have distributed and comprehensive actions so they have developed a registry system to get over this problem. Thus, such a system might also be suggested for software users. Incorporating software should be regarded as a consequence of the need to organize commercial activities on a higher plane, as in the example of the fiction of the corporation.

The most characteristic result of attributing a business organization, called a corporation, an independent legal personality from its shareholders is that, by this way the software could be both the plaintiff and the defendant. Corporations having an independent asset is another consequence, which is significant for the compensation of liabilities which may arise due to the abovementioned actions. Among these assets, the reference code smart software, databases they have or developed, revenue received in exchange for its services and profit from dealing can be counted. Just like in the operation of a company, it can also be possible that intelligent agents can also make back up and protect themselves within the framework of certain principles.

Giving intelligent agents such special status is a development that would allow supervision and transparency in its design. Regarding these systems, which have the capability to act in such an autonomous and comprehensive way, as mere commodities waiting for the detection of their proprietors' actions, might result in serious problems that are not easy to compensate and shall put jurists under the obligation to find answers to questions far beyond their competency. Moreover, it is extremely beneficial to predetermine the rules and obligations which intelligent agents will be subject to, as in the case with corporations. While an intelligent agent's working principles and operation would be supervised by the registry authority, a body resembling the administrative board will determine its commercial strategies and fundamental decisions. Along with this, there might be units responsible for its maintenance and repair, similar to corporations. It is no doubt that legal and organizational problems concerning real persons, like members of the Board of Directors, similar to those in companies, will also arise with regards to intelligent agents.

Furthermore, assigning a status of legal personality to intelligent agents may also be effective for the solution of problems concerning

[26] Marcel Waline, *Törel Kişilik Kuramı (La Theoire des Personnes Juridiques)*, translated by. Hamide Uzbark, A.Ü.H.F.D. 1944 Volume 2 No: 2-3, 306-322, p.311

e-business applications for issues such as determining identification and jurisdiction. Additionally, the registry system can be used to avoid their use for corrupt purposes, to a certain extent.

IV- CONCLUSION

It will not be wrong to claim that robots and machines, which are going to be more autonomous and functional in the near future (as stated above), can be formed into a structure which needs to be controlled through an organizational process within the framework of legal personality. Even though they assume functions like those of a salesperson or a secretary today, it is generally accepted that studies on intelligent agents, which are artificial intelligence applications, will be to create machines which will have discretion and lingual abilities at the level of human beings. It is expected that a computer or a computer network with sufficient processor power would develop a set of concepts and thinking principles exceeding the capacity of humans. Such a structure might assume functions like workflow control, source optimization and even negotiation. Besides, it can comprehend all information present in electronic format on the Internet and consequently produce new information without any human involvement. Machines designing more developed and eminent systems will be the inevitable result of this snowball effect. As computers' linguistic skills improve, systems forming discourse powerful enough to convince human beings of new consumer and political preferences may be designed. Intelligent agents, which could have the ability to be effective in the fields like political propaganda, advertisement and public relations, should not be underestimated and considered to be only mere scripts of science fiction.[27]

Rather than attempting to elasticize the definition of property with various extensions and comments, legal personality and the company model, which are more relevant options for intelligent agents, should be evaluated with meticulous attention. Future projections show that business organizations will more and more become structures that are a mixture of both men and machine, which accounts for the fact that machines, which are continuously producing and disseminating knowledge, will need a status different than that of a mere commodity.

In conclusion, I find it necessary to state again that this essay is only a first attempt and that the legal questions discussed herein are actually connected to so many legal disciplines that a single lawyer cannot solely be competent in all these issues. Although for sure there are many questions without answers yet, all answers may at the same time be new questions.

[27] Studies on using robots in fields difficult, expensive and requiring extreme patience such as the education of the autistic children are continuing; See http://homepages.feis.herts.ac.uk/~comqkd/Dautenhahn+04.pdf