

Intelligent Agent: Modern Challenge to The Rule of Law

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Abstract: At the dawn of the fourth industrial revolution, the integration of automation, artificial intelligence, and machine learning has revolutionized societal functions, enabling computers to autonomously process and analyze information. Unlike traditional tools, intelligent agents now act independently, with mobility and autonomy, raising questions about their ability to assume obligations and enter into contracts on behalf of users. This study seeks to explore the legal challenges surrounding intelligent agents, with a specific emphasis on their legal status, particularly in light of advancements in their current generation.

Keywords: Intelligent agent, legal status, agency, e-person, liability.

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Introduction:

“We have no experience with what it’s like to have things smarter than us”

Geoffrey Hinton,¹

Understanding and shaping the new technological revolution is the most intense and important of the many varied and interesting challenges we confront today.²

We’re merely beginning a revolution that’s really changing how we live, work, and interact with each other. The fourth industrial revolution is really something else—it’s on a whole different level in terms of scale, scope, and complexity compared to anything we’ve seen in the past.³

At the dawn of Industry 4.0⁴, combining automation, machine learning and artificial intelligence⁵, the integration of computers and telecommunications systems has significantly transformed how society functions and organizes itself. Initially regarded as mere tools for processing and recording data, computers have since evolved to autonomously process, transmit, and analyze information.

While individuals have been engaging in electronic contracts for some time, agreements facilitated by intelligent agents possess distinct characteristics that differentiate them significantly from those formed through other electronic or automated methods.

In fact, intelligent agents possess the ability to act independently, rather than simply executing instructions. They also demonstrate significant mobility, intelligence, and autonomy. This raises ongoing concerns about their ability to assume obligations and enter into binding contracts on behalf of their users.

This study seeks to address the key doctrinal challenges posed by the use of intelligent agents, exploring what their appropriate legal status should be, particularly in light of advancements in their current generation.

¹ Geoffrey Hinton often called the ‘godfather of artificial intelligence, **check** the website: <https://discover.research.utoronto.ca/26059-geoffrey-e-hinton>, said minutes after the announcement that he and Jhon Hopfield had been awarded the Nobel Prize in physics -08 October 2024- for their research into enabling machine learning with artificial neural networks, **check** the website: <https://www.nobelprize.org/prizes/physics/2024/press-release/>, 10 October 2024.

² A refrain constantly heard today is that artificial intelligence is transforming the world as we know it, **check:** *Report on Artificial Intelligence and Civil Liability*, British Columbia Law Institute, 2024, p 07, available on the website: <https://www.bcli.org/wp-content/uploads/Report-AI-and-civil-liability-final.pdf>, 15 September 2024.

³ Klaus Schwab, *The Fourth Industrial Revolution*, World Economic Forum, Switzerland, 2016, p 07.

⁴ Building on the third industrial revolution, which included the creation of the PC and the internet, Industry 4.0 is taking technology to a new level of evolution, blurring the lines between the digital and physical worlds. Element such as automation, Artificial intelligence, the internet of things, and others are becoming more and more common, **check** Rashiya Bekmurzaeva, G.S Kovalev, *Industry 4.0: The Fourth Industrial Revolution*, SHS Web of Conferences 172, 2023, p 01, available on the website: https://www.researchgate.net/publication/372339190_Industry_40_The_Fourth_Industrial_Revolution, 16 September 2024.

⁵ The artificial Intelligence (AI) is a branch of Computer Science, which is mainly concerned with automation of intelligent behavior. This behavior we may consider from all domains- the human, animal world, and vegetation. A compact definition of Intelligence is: **Intelligence = Perceive+ Analyze+ React**, **check** K.R Chowdhary, *Fundamentals of Artificial Intelligence*, Springer, 2020, p 01, available on the website: <https://link.springer.com/book/10.1007/978-81-322-3972-7>, 18 September 2024.

I- Legal implication of intelligent agents on the Rules of Law

A new era of electronic contracting is emerging, where intelligent agents are becoming more integrated into everyday life; their actions (negotiating, formulating, and monitoring contracts) pose unique challenges and implications to the rule of law.

Hence, it is necessary to understand the meaning of an intelligent agent and address in addition the impact of intelligent agent development on legal framework.

1-Understanding intelligent agent

1-1 The concept of intelligent agent

Despite the widespread use of the term “intelligent⁶ agent”, it is difficult to establish in a universally accepted definition. Some have defined it based on its characteristics⁷, while others have defined it based on its function⁸.

The term “intelligent agent” refers to an entity with characteristics of intelligent human behaviour. Intelligent software agents (often deployed on the Internet for e-commerce related activities) have a number of important properties, but the two most significant are their autonomous behaviour and capacity of decentralized action (they work together to solve a complex problem, even though there is no central control over the agents and they are distributed in different parts of an environment)⁹.

The French association for normalisation (AFNOR) defines an intelligent agent as follows: “An object using artificial intelligence techniques: it adapts its behavior to its environment and, by memorizing its experiences, acts as a subsystem capable of learning. It enhances the system that uses it by adding, over time, automatic functions for processing, control, memory, or information transfer.”¹⁰

⁶ Intelligent, because they are not just programmed for a single and repetitive motion but they can adapt to do more (and in a better way) by adapting to different situations and contexts. Nevertheless, they are able to understanding languages, recognize pictures, solve complex problems by themselves and learn as they go along without constant supervision (machine learning), **check:** Francesco Cavinato, Federica Casano, *AI “agents”: to be, or not to be, in the legal domain*, Dundee student law review, Vol 05, No 02, 2019, p 02.

⁷ It was defined by Wooldridge and Nicholas Jennings as follows: “the most general way in which the term agent is used is to denote a hardware or (more usually) software-based computer system that enjoys the following properties: a) *autonomy*: agents operate without the direct intervention of humans or others, and have some kind of control over their actions and internal state; b) *social ability*: agents interact with other agents (and possibly humans) via some kind of agent-communication language; c) *reactivity*: agents perceive their environment (which may be the physical world, a user via a graphical user interface, a collection of other agents, the Internet, or perhaps all of these combined), and respond in a timely fashion to changes that occur in it; d) *pro-activeness*: agents do not simply act in response to their environment, they are able to exhibit goal-directed behaviour by taking initiative.”, **check:** Michael Wooldridge and Nicholas R.Jennings, *Intelligent agents: Theory and Practise*, The knowledge engineering Review, vol. 10:2, 1995, p 116.

⁸ “An Intelligent agent is software that assists people and acts on their behalf. Intelligent agents work by allowing people to delegate work that they could have done, to the agent software. Agents can, just as assistants can, automate repetitive tasks, remember things you forgot, intelligently summarize complex data, learn from you, and even make recommendations to you”, **check:** Don Gilbert, *The Right Information at the Right Time*, IBM Corporation Research Triangle Park, NC USA, 1997, p 01.

⁹ Rex M. Shoyama, *Intelligent agents: Authors, makers, and Owners of computer-generated Works in canadien copyright Law*, Canadien Journal of Law and Technology, Vol 4 :2, 2005, p 129.

¹⁰ John Wisdom, *Intelligent internet agents: Economic and societal Issues*, Doctorate dissemination in Information Systems Economics, National School of Telecommunications, 2005, p 70.

According to this definition, often cited in specialized literature, the term “intelligent agent” refers to the presence of artificial intelligence¹¹ in a program.

In this regard, artificial intelligence plays a fundamental role in empowering intelligent agents with capabilities that mimic human intelligence. And here are some cases where artificial intelligence is used in intelligent agents:

- **Machine learning:** artificial intelligence like supervised, unsupervised, and reinforcement learning help agents learn from data, adapt to new situations, and personalize their behavior for users.
- **Making intelligent choices:** artificial intelligence algorithms help agents analyse complex situations, predict outcomes, and make informed decisions to achieve their goals. For example, Self-driving cars¹².
- **Natural Language Processing (NLP):** NLP techniques enable agents to understand and respond to human language, whether spoken or written, facilitating more natural interaction. For example, Chatbots program¹³.

As for the legislative definition, the electronic agent has been defined by Section 2/ 6 of the UETA¹⁴ as follows: “Electronic agent means an electronic sound, symbol, or process attached to or logically associated with a record and executed or adopted by a person without review or action by an individual”¹⁵.

In between, it is duly noted that in the context of the Law No. 18-05 of 10 may 2018 on the electronic commerce, that the Algerian legislator did not mention the definition of the electronic agent, but it explicitly stipulated resorting to electronic means for concluding transactions.¹⁶

1-2 Legal issues in intelligent agent for electronic contracting

In the age of automation, the identical issue was addressed in the law of contract, when people were asked to enter contracts with non-humans, with a computerized network in the internet, with a money-withdrawal machine. And with the advent of electronic contracting. Intelligent agents contracting on behalf of individuals is not a new phenomenon. Vending machines have been part of our daily lives for a long time. However, intelligent agents differ from these machines as they not only take on an active role but also initiate and conduct negotiations. In other words, they negotiate independently or solicit bids¹⁷.

¹¹ The European Commission defines artificial intelligence as follows: “Artificial intelligence (AI) refers to systems that display intelligent behaviour by analysing their environment and taking actions- with some degree of autonomy- to achieve specific goals”, check: Antonia Waltermann, *On the legal responsibility of intelligent agents*, Technology and Regulation, 2021, p 380.

¹² Velibor Bozic, *Intelligent Software Agents and artificial intelligence*, 2024, pp 4.5, <https://www.researchgate.net/publication/378691098> , 15 July 2024.

¹³ Chatbots means « comprehending user queries and responding in a coherent and relevant manner », Ibid, p 5.

¹⁴ UETA: United State Uniform Electronic Transactions Act.

¹⁵ In addition to The Federal Law of the United Arab Emirates No. (1) of 2006 on Electronic Commerce and Transaction, which has used the term “**Automated Electronic Agent**” and defined it as “A computer program or Electronic means used independently to initiative an action or response in whole or in part without review or action by an individual at the time of the action or response”.

¹⁶ **See:** Article No 06 of Law No 18-05, dated 10 may 2018, on *the electronic commerce*, published in the official journal, number 28, dated 16 may 2018, p 5.

¹⁷ Emre Bayamlıoğlu, *Intelligent Agents and their Legal Status*, Ankarabar review, 2008, p 47.

Intelligent Agent: Modern Challenge to The Rule of Law

The situation in contract law has become more complex, especially in situations when computers are acting on both sides of the contractual relation¹⁸. Contract law in the United States and in Canada did come up with bold reactions. According to the UETA, a contract can be established through interactions between the electronic agents of the parties involved, even in cases where no person was aware of or reviewed the actions of these electronic agents, or the terms and agreements that resulted.¹⁹

It is important to note that this section draws on article 11 of UNICTRAL²⁰ Model Law on Electronic Commerce. This article asserts that, in the formation of contracts, unless the parties agree otherwise, both offers and acceptances can be communicated through data messages²¹. Moreover, a contract established by data messages cannot be invalidated or rendered unenforceable only on the basis that data messages were utilized in its formation.

The UETA is a less challenging law compared to the Uniform Computer Information Transactions Act (UCITA)²². Under UCITA, electronic agents can conclude contracts.²³ A valid contract is one established through the interaction of electronic agents to perform transactions where an offer is considered certain, unless a court determines that it results from an electronic error, fraud or commensurate circumstance. Additionally, a valid contract may be established through the interaction between electronic agents and individuals who are acting on their own behalf or on behalf of another individual.²⁴

2- The impact of intelligent agents development on the legal framework

Intelligent agents evolved from simple tools with limited autonomy and decision-making, relying entirely on user's instructions, to more advanced systems capable of independent decision-making as technology and artificial intelligence.

2-1 The first generation

The first generation of electronic agents is defined by restricted autonomy, mobility, and intelligence. These agents operate in a fully automated manner, rather than autonomously, adhering strictly to users instructions and pre-established programming. Typically stationary, they function within a user-controlled environment, making their actions and outcomes largely predictable. These agents execute fundamental and supplementary functions inside contractual procedures, including retrieving product information from the internet, comparing prices,

¹⁸ Gunther Teubner, *Rights of non-humans? Electronic Agents and Animals as New Actors in Politics and Law*, Journal of Law and society 33, 2006, p 09, available on the website: https://www.jura.uni-frankfurt.de/42853034/Aktanten_eng_final-1.pdf, 20 July 2024.

¹⁹ Section 14 of the Uniform Electronic Transactions Act, available on the website: <http://euro.ecom.cmu.edu/program/law/08-732/Transactions/ueta.pdf>, 22 July 2024.

²⁰ UNICTRAL: the United Nations Commission on International Trade Law

²¹ It is noteworthy that the UNICTRAL Law does not explicitly address intelligent agents; however, it does mention the term "data message", which indirectly includes intelligent agents.

²² Irene Kefza, Eleanna Kafeza, Dickson K.W. Chiu, Proceedings of the 38th Hawaii Conference on System Sciences, 2005, p 04, available on the website: https://www.academia.edu/1429833/Legalissues_in_agents_for_electronic_contracting?email_work_card=view-paper, 22 July 2024.

²³ Section 202 of The Uniform Computer Information Transactions Act (UCITA).

²⁴ Irene Kefza, Eleanna Kafeza, Dickson K.W. Chiu, op cit, p 04.

proposing products based on user preferences, and occasionally submitting purchase offers in accordance with predetermined criteria and constraints.²⁵

The human operator still has the final say in designating the product of merchant, or validating and rejecting the transaction intervened in, it's in instances like this where he maintains in control of the contractual process. In conformity with the traditional approach,²⁶ considering such agents as complex communication tools laden with transmitting the will of their users, further expanding the scope of interaction between the parties so individuals can direct business transactions by giving them an alternative approach for this²⁷.

Previously, if we take as an example of how application of contract and tort law which generally plays an adequate supporting role for the first generation of intelligent agents, the courts have applied tests and a traditional way in case people make modifications to bypass data entry controls or to distribute obscene electronic documents. Contract and tort law applies to electronic tasks as well as mechanical ones, and the use of first-generation intelligent agents is the same as the use of any tool with predictable behaviour to accomplish a task. Contract and tort law are as applicable to electronic tasks as to mechanical ones, and using the first-generation intelligent agents is just like using any tool with consistent conduct to affect a task.²⁸

2-2 the second generation

Second-generation intelligent agents have significant degree of autonomy,²⁹ mobility and intelligence in contrast to first-generation agents. Second generation agents are allocated decision-making capacity based not only on their pre-existent knowledge and user instructions, but also on their own experience and cognitive state.³⁰

Nevertheless, for the second generation of intelligent agents applying law cannot be as simple. In relation to the ability of these agents to adapt and even act to learn without any action on the part of humans. Thus, the second generation of intelligent agents engage in an independent way that no software programs had previously dealt with.

²⁵ Emad Abdel Rahim Dahiyat, *Law and software agents: Are they "agents" by the way?*, Artificial intelligence and Law, Springer, 2020, p 77.

²⁶ This was addressed in the second part of the article.

²⁷ Emad Abdel Rahim Dahiyat, *op cit*, p 77.

²⁸ Suzanne Smed, *intelligent Software Agents and Agency Law*, Santa Clara High Technology Law Journal, Vol 14, Issue 2, 1998, pp 504-505, available on the website: <https://digitalcommons.law.scu.edu/cgi/viewcontent.cgi?article=1237&context=chtlj&httpsredir=1&referer=>, 25 July 2024.

²⁹ To the extent that an agent relies on the prior knowledge of its designer rather than on its own percepts, we say that the agent lacks autonomy. A rational agent should be autonomous-it should learn what it can to compensate for partial or incorrect prior knowledge. For example, a vacuum-cleaning agent that learns to foresee where and when additional dirt will appear will do better than one that does not. As a practical matter, one seldom requires complete autonomy from the start: when the agent has had little or no experience, it would have to act randomly unless the designer gave some assistance. So, just as evolution provides animals with enough built-in reflexes to survive long enough to learn for themselves, it would be reasonable to provide an artificial intelligent agent with some initial knowledge as well as an ability to learn. After sufficient experience of its environment, the behavior of a rational agent can become effectively independent of its prior knowledge. Hence, the incorporation of learning allows one to design a single rational agent that will succeed in a vast variety of environments, **check:** Stuart Russell, Peter Norving, *Artificial Intelligence: A modern approach*, 4th Edition, Pearson Series, England, 2020, p 42, available on the website: <https://dl.ebooksworld.ir/books/Artificial.Intelligence.A.Modern.Approach.4th.Edition.Peter.Norvig.%20Stuart.Russell.Pearson.9780134610993.EBooksWorld.ir.pdf>, 25 July 2024.

³⁰ Emad Abdel Rahim Dahiyat, *op cit*, p 78.

Intelligent Agent: Modern Challenge to The Rule of Law

The law must be applied without factual precedent to these kinds of situations, instead of anticipating a legal system that tries, for example, to assign responsibility to software itself when it is capable of unprogrammed rather than predictable behaviour.³¹

II- Legal Status of intelligent agents as a challenge to current Legal Rules

Through the development of advanced intelligent devices capable of operating independently³², we face the possibility of these systems expressing emotions or exhibiting aspects of “personality”.

While computers lack legal personality and legal capacity, that is to say the possibility of being subjects of rights and obligations, of expressing a valid and binding will, of being liable for their own actions.

In this regard, traditional and modern approaches have emerged, attempting to address the legal status of intelligent agent.

1- Traditional approaches to the legal status of intelligent agent

1-1 Intelligent agent as a machine or tool “Traditional approach”

A potential answer to the issue of consent is to regard the entire declarative procedure as executed by a person. It would involve creating a legal presumption, termed "legal fiction," whereby all transactions conducted by the computer are regarded as transactions executed by the human trader. This approach assigns the intention and associated risks of the transactions to the individual best positioned to manage this "fiction" based on the assumption that a person consents to a declaration or contract, even if they are unaware that such a declaration was made or that a contract was formed, or if they lack knowledge of the specific terms of the declaration or contract.³³

A critical look at the aspect of contracting via the electronic agents presents a perspective that these agents may be in a position to establish contracts on behalf of the user. This may be because the users usually give the intelligent agent instructions and consent to make contracts with other agents. In that case, the intelligent agent fully represents the user and performs actions akin to those of a human. However, some scholars argue that an intelligent agent only has contracting authority if explicitly granted by the user. Otherwise, it remains merely a machine, tool, or technological device executing tasks based on its programming³⁴.

The acceptance of this theory would have a clear impact on the individual who programs, controls, or otherwise utilizes an intelligent agent. Ultimately, these individuals would be subject to a liability regime that is comparable to the one that applies to the use of vehicles or machines by the owner. This principle is recognized in civil law rules. For example, Article 138 of the Algerian civil code states: “Anyone who takes custody of an object and has the ability to

³¹ Suzanne Smed, op cit, p 505.

³² Computer systems are now emerging that can operate not just automatically but autonomously, **check:** T. Allen and R. Widdison, *Can Computer Make Contracts?*, Harford Journal of Law and Technology, Vol 09, issue 01, 1996, p 27.

³³ Francisco Andrade, Paulo Novais, José Machado, José Neves, *Contracting agents: legal personality and representation*, Artificial Intelligence Law, Springer, 2007, p 360.

³⁴ Enas Qutieshat, Ola Abbasi, *Contracting via Electronic agent and the Matter of Legal Personality*, 2020, p 03, https://www.researchgate.net/publication/339069260_Contracting_via_Electronic_Agent_and_the_Matter_of_Legal_Personality, 29 July 2024.

use, manage, and supervise it is considered responsible for any damage caused by that object”. While the prevailing theory views intelligent agents as mere machines or tools owned by individuals, some authors are exploring alternative perspectives. It is not entirely unreasonable to consider the possibility of recognizing intelligent agents as legal persons in the near future³⁵.

1-2 the application of agency law:

This possibility prompts us to examine another significant issue, specifically the one associated with the “agency paradigm” and its potential application to intelligent agents³⁶. This approach involves the application of Agency law to intelligent agents, aiming to formulate a theoretical framework for electronic contracting³⁷ and associated liability. A variety of authors have highlighted this approach as a method for addressing the challenges posed by the rise of intelligent agents in the world of e-commerce.³⁸

According to the law of agency, a person (agent)-who, in civil law jurisdictions, must have legal and contractual capacity, that is, must be a natural or legal person- is assigned the task to conclude a contract in the name and on behalf of her other contractual partner, but the legal effects of the concluded contract are attributed directly to the principal. Regarding the agent’s legal and contractual capacity in civil law jurisdiction’s, the agent has to have legal capacity and contractual capacity- even a restricted one; in other words, the agent must be naturel or a legal person³⁹.

Therefore, the independence of the advanced generations of such agents is unquestionably disregarded by the proponents of this solution, who also confuse the concepts of automation and autonomy. There is Also a misunderstanding regarding the distinction between intelligent programs that represent a free and non-standardized environment.⁴⁰

Significantly, there are other issues about the establishment of the declared agency, in terms of legal doctrine:

- The intelligent agent lacks legal and contractual capacity, differentiating them from human agents. The only way for the rules on disclosed agency to apply here is again by a double analogy, acknowledging a fictitious legal and, accordingly, contractual capacity⁴¹.
- The main practical issue is that when an intelligent agent is used, the user doesn’t know the eventual counterpart to grant authority directly to the artificial intelligence. Consequently, the contract may be concluded without the necessary authority, making it legally unenforceable against the principal. This problem also exists in common law, where agency

³⁵ Enas Qutieshat, Ola Abbasi, op cit, P 361.

³⁶ Francisco Andrade, Paulo Novais, José Machado, José Neves, op cit, p 367.

³⁷ The application of the rules of agency to electronic transaction « when a principal uses a computer in the same manner that it uses a human agent », **check:** Fischer, *Computers as agents: a proposed approach to revised U.C.C*, Indiana Law J, Vol 72, Issue 02, 1997, p 557.

³⁸ Emad Abdel Rahim Dahiyat, op cit, p 72.

³⁹ Visiliki Papadouli, *The Role of the Autonomous Machines at the conclusion of a contract: contractual Responsibility According to Current Rules of Private Law and prospects*, Artificial Intelligence and Normative challenges, Law, Governance and Technology Serie 59, Springer, 2023, p 75, available on the website: https://doi.org/10.1007/978-3-031-41081-9_5, 02 August 2024.

⁴⁰ Emad Abdel Rahim Dahiyat, op cit, p 73.

⁴¹ Visiliki Papadouli, op cit, p 76.

Intelligent Agent: Modern Challenge to The Rule of Law

typically relies on an express agreement between the principal and agent. Since intelligent agents lack legal status, they cannot receive formal authority⁴².

- In multi-agent systems⁴³, it can be very challenging for the other party to identify the user-principal in order to request their ratification a contract made by the intelligent agent without proper authority.
- If the user or principal does not validate the transaction, the intelligent agent, lacking legal personality, cannot be forced to perform the contract. As a result, the burden of risk lies solely with the other party. This highlights the issue that legal protections for false agents, designed to safeguard the contractual counterparty, do not apply to intelligent agent.
- It remains unanswered, whether the user should be held legally bound, in case her “employed” intelligent agent delegates its tasks to other intelligent agents (sub-agency), especially in the framework of a multi-agent system⁴⁴.

2- Traditional approaches to the legal status of intelligent agent:

2-1 intelligent agent as a legal person “modern approach”:

This approach considers an intelligent agent as a legal person⁴⁵ capable of entering into contracts either as a principal or as an agent, thereby adhering to traditional contract law principles that necessitate the will of a person rather than that of an artifact.⁴⁶

This solution aims to acknowledge intelligent agents as legal persons⁴⁷ and formulate a liability theory⁴⁸ based on this recognition. Some scholars suggest that giving intelligent agent legal

⁴² IBID, p 77.

⁴³ Multi Agent System can be best characterized systems as a software technology that is able to model and implement individual and social behavior in distributed systems. It is a loosely coupled network, in which all problem solvers (agents) are interacting to each other to solve a given problem which cannot be solved by a single agent. It is a software technology which model and implements the individual and social behavior in distributed environment. It is characterized by cooperation, coordination, role assignment; negotiation and self-organization. Multi Agent System are used for the distributed and open system. Serval issues to be considered for development of multi agent system like: character of an agent, function to be performed, communication, language, protocols, cooperation etc, **check**, Archana Mangal, Iti Mathur, *A Framework for Machine Learning based Multi agent system*, Journal of Computer Engineering, Vol 19, Issues 4, 2017, p 40, available on the website: https://www.academia.edu/68083866/A_Framework_for_Machine_Learning_based_Multi_Agent_System, 06 August 2024.

⁴⁴ Visiliki Papadouli, op cit, p 77.

⁴⁵ The legal personhood of robots has been a popular topic of today’s debate on the normative challenges brought about by this technology, for example, In October 2017, Sophia made headlines when Saudi Arabia granted her citizenship making her the first robot to receive legal personhood in any country, **check**, Ugo Pagallo, *Vital, Sophia, and Co – The Quest for the legal personhood of robots*, journal of information, 2018, P 01, available on the website: https://www.researchgate.net/publication/327567440_Vital_Sophia_and_CoThe_Quest_for_the_Legal_Personhood_of_Robots, 08 August 2024.

⁴⁶ Emad Abdel Rahim Dahiyat, op cit, p 65.

⁴⁷ IBID, p 65.

⁴⁷ The requirements or attributes of legal personhood are: 1) a person shall be capable of being a subject of law, 2) being a legal subject entails the ability to exercise rights and perform duties, and 3) the enjoyment of rights needs to exercise awareness and choice. However, those are just the formel requirements that we currently set to those that are legal persons, check: Solaiman, S.M, *Legal personality of robots, corporations, idols and chimpanzees: a quest for legitimacy*, Artificial Intelligence and Law, Springer, Vol 25, Issue 2, 2017, P 161. Available on the website: <https://link.springer.com/article/10.1007/s10506-016-9192-3>. 08 August 2024.

⁴⁸ The European Parliament Resolution of 16 February 2017 withs recommendations to the Commission on Civil Law on Robotics recommends creating a specific legal status for autonomous robots, so that they enjoy the status of electronic persons with specific rights and obligations, including that of making good any damage they may

personality offers benefits like limited liability and sustained legal capacity, particularly for self-modifying or autonomously acting agents. This approach would hold computers partially accountable for their actions, similar to a natural person. This solution, however, does not require that the law regard intelligent agents as persons equivalent to humans; rather, it emphasizes the technical legal definition of a person as an entity possessing specific legal rights and obligations that align with its nature, function, and task.⁴⁹

This approach questions the feasibility and implications of treating intelligent agents as legal persons; it raises concerns about their current level of autonomy, the potential for legal rights, and the nature of their responsibilities and contractual commitments. It also explores whether intelligent agents can act in good or bad faith. The complexity of this issues, involving philosophical, legal, and technical aspects, make this solution highly debatable⁵⁰.

Recognizing legal personhood for intelligent agent offers a promising solution to liability challenges. By transforming intelligent agents from a tool to a legal entity or “person”, the entire legal framework is reshaped. Liability would instead be determined by the decisions and actions of the intelligent agent itself, rather than those of the user. This marks a shift in focus from the conventional connection between the user’s involvement (such as deploying the intelligent agent) and the resulting harm, to a direct link between the intelligent agent’s actions and the damage that⁵¹.

The unpredictability of intelligent agent decisions becomes legally irrelevant, much like with human actions. The key question would be whether the intelligent agent choice could foreseeably lead to damage, regardless of it being a machine. Establishing intelligent agent liability doesn’t mean the intelligent agents compensates victims directly but allows the user, as the principal, to be held accountable for typical risks associated with the intelligent agent actions⁵².

2-2 Progressive approach: the “electronic person” – proposal for a new legislation:

Considering current legal frameworks, the creation of new regulations isn’t far off⁵³. Why not introduce an electronic person (ePerson) alongside natural persons and legal entities? Some authors suggest this is feasible since we already recognize entities that aren’t human but have legal and contractual capacity.

cause to third parties independently, IBID. The European Parliament Resolution recommended an obligatory insurance scheme and a supplementary fund to address the complex liability issues arising from increasingly autonomous robots, and also urges to assign each robot an individual registration number linked to its fund, making it easier to identify the fund’s details, liability limits, contributors, and their roles. See paragraph 57 and 59 of the European Parliament Resolution of 2017.

⁴⁹ Emad Abdel Rahim Dahiyat, op cit, p 65.

⁵⁰ IBID, p 67.

⁵¹ Angelo Kornilakis, *Legal Personhood for Autonomous AI: Pratical Consequences in Private Law*, Artificial Intelligence and Normative challenges, Law, Governance and Technology Series 59, Springer, 2023, P 34, available on the website: <https://www.springerprofessional.de/en/legal-personhood-for-autonomous-ai-practical-consequences-in-pri/26334408>, 11 August 2024.

⁵² IBID, p 34.

⁵³ We aimed at demonstrating that, with the proliferation of artificial intelligence, questions will rise and the legal framework will inevitably need to adapt. We believe that « the more autonomous robots are, the less they can be considered simple tools in the hands of other actors », **check:** Corneliu Andy pusca, *Legal Aspects on the Implementation of artificial Intelligence*, EAI Endorsed transactions on Creative Technologies, Volume 07, Issue 24, 2020, p 04.

Intelligent Agent: Modern Challenge to The Rule of Law

To address concerns about the accountability and responsibility of advanced autonomous systems, the idea of granting these intelligent agents a special legal status has been proposed. For instance, the European Parliament's 2016 Report on Robotics discussed various issues that need to be addressed in future legislation concerning autonomous systems, like self-driving cars and healthcare robots. The report emphasized that as robots gain more autonomy, we must evaluate whether current liability laws are adequate or if new principles are needed to clarify legal responsibility for harm caused by robot⁵⁴.

According to the report, any future legal framework should include an impact assessment that considers, among other factors, the potential implications of granting robots a distinct legal status. In the long term, this could mean recognizing the most advanced autonomous robots as having an "electronic person" status, making them liable for compensating any damage they cause. This concept of electronic personality could also apply in situations where robots make autonomous decisions or interact independently with third parties.⁵⁵

This notion of robots having a special legal status as "electronic persons" has been met with scepticism and criticism, and many argue that there is not yet a practical need for such a status. However, given how different legal systems have granted a degree of personhood to various non-human entities (including animals, ships, temples and idols), there is nothing preventing states from granting intelligent agents a degree of legal personality⁵⁶.

The main question is: who is liable? If everything runs smoothly, legal issues are minor. But when problems arise, it gets complicated. Traditionally, the agent's owner is liable. A modern view suggests the intelligent agent could be liable, but practically, it falls back on the owner. The ePerson concept offers a key benefit: it limits the owner's liability⁵⁷.

In general, we align with scholars who argue that it is premature to grant personhood to machines or intelligent agents. A letter addressed to the European Commission, signed by 285 experts in artificial intelligence, robotics, law, medicine, and ethics, as well as industry leaders, raises concerns regarding the European Parliament's resolution on civil law rules for robotics. In particular, the experts challenge the recommendation in paragraph 59(f), which suggests creating a distinct legal status for autonomous, unpredictable, and self-learning robots. The petitioners stress that it cannot be definitively stated that liability would be impossible to establish when damage is caused by highly sophisticated machines. From a technical perspective, however, experts argue that the assertion made by the European Parliament's Committee on Legal Affairs is erroneous. It frequently overstates the true capabilities of even the most sophisticated robots, provides a cursory comprehension of unpredictability and self-learning abilities, and reflects a perspective on robots influenced more by science fiction and a few recent sensational reports than by a realistic assessment of the technology.⁵⁸

⁵⁴ Samuli Haataja, *Attributing Conduct of Autonomous Software Agents with Legal Personality under International Law on State Responsibility*, Artificial Intelligence and Normative challenges, Law, Governance and Technology Series 59, Springer, 2023, p 112, available on the website: https://doi.org/10.1007/978-3-031-41081-9_3, 05 September 2024.

⁵⁵ The European Parliament Resolution of 16 February 2017 with recommendations to the Commission on Civil Law on Robotics, available on the website, https://www.europarl.europa.eu/doceo/document/A-8-2017_0005_EN.pdf, 07 September 2024.

⁵⁶ Samuli Haataja, op cit, p 112.

⁵⁷ Eberhard Zehendner, A legal analysis of human and electronic agents, Artificial Intelligence and Law, Springer, 2004, p 128, available on the website: <https://link.springer.com/article/10.1007/s10506-004-0815-8>, 20 August 2024.

⁵⁸ Riccardo Campa, Christopher Corbally, Margaret Boone Rappaport, Electronic persons. It is premature to grant personhood to machines but never say never, *Gregorianum*, Vol 101, 2020, p 798, available on the website:

Conclusion:

This article aims to challenge outdated frameworks that hinder adaptation to the significant changes driven by recent scientific and technological advancements. As an invitation to reflection, it does not seek to provide a definitive or conclusive solution to the inherently complex issue of intelligent agents.

The first generation of electronic agent cannot learn from experience, limiting their decision-making and subjecting them to traditional legal responsibility. However, advancements in artificial intelligence are enabling the development of smarter, autonomous second generation of intelligent agents. The agents, capable of learning and independent action, are likely to gain legal status.

Anyway, if intelligent agents were to be recognized as legal persons, it would logically follow that they could seek the necessary cooperation to achieve their intended objectives. However, this recognition would require conferring legal personality upon these agents. While this idea may appear intriguing, the reality is that we have not yet reached this point. At present, it is not feasible to classify "intelligent agents" as legal persons. Nevertheless, these agents are increasingly prevalent and available for autonomous tasks in electronic trading. Should we accept the premise of viewing them merely as tools utilized by humans, despite the fact that humans may not always maintain control over them? Alternatively, is there another viable solution? Currently, global legislation has not yet established a definitive legal framework concerning intelligent agents.

In conclusion, it is advisable to maintain an open-minded approach regarding the potential for machines to develop forms of consciousness and autonomy in the long term. Historically, rejecting innovative ideas has often been a misjudgement. Furthermore, there is a pressing need to develop legal frameworks that can keep pace with technological advancements related to agents, particularly in the context of artificial intelligence, automation challenges, and the Fourth Industrial Revolution.