



The Legal Nature of the Intelligent Electronic Agent in Electronic Transactions: Concepts and Challenges

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Abstract

The intelligent electronic agent constitutes one of the most significant manifestations of artificial intelligence deployment in the legal sphere. It refers to a second-generation digital software program, grounded in artificial intelligence, installed on automated devices to execute designated tasks and autonomously render decisions in the formation of electronic contracts. This technology profoundly influences both the digital ecosystem and the legal landscape. The present study delineates the legal nature of the intelligent electronic agent and elucidates the contemporary legal challenges attendant upon its utilization. It examines the persistent discrepancy between technological progress and prevailing legislative frameworks, with particular emphasis on critical issues including legal liability, data protection, and the validity of electronic contracts.

The analysis culminates in several key findings. Foremost among them is the recognition that attributing independent legal personality to the intelligent electronic agent remains a profoundly intricate proposition. While the agent exhibits notable autonomy, initiative, environmental interaction, and capacity to engage in contract formation, it remains inextricably tethered to the human programmer or operator who designed or deploys it. Consequently, the study underscores the imperative to remedy existing legislative lacunae by accommodating innovative contracting modalities—such as those facilitated by intelligent agents—and integrating them as integral components of the contemporary legal order.

Keywords: intelligent electronic agent, artificial intelligence, legal challenges, legal liability, data protection, electronic contracts.

Introduction

It is widely acknowledged that technology in the modern era has achieved advancements far exceeding prior expectations. What was discussed in the late 20th century regarding globalization and modernity in information and communication technology bears little resemblance to the developments ushered in by the early 21st century, marked by the emergence of the digital revolution and a technological transformation intertwined with artificial intelligence. This has fundamentally altered numerous paradigms and introduced the concept into various scientific disciplines, including the legal field.



Within this context—particularly in the realm of contracting—the machine has assumed a central role in concluding contracts and expressing will, through what is known as the intelligent electronic agent. This agent operates on advanced algorithmic systems and artificial intelligence techniques, enabling it to perform a range of tasks, execute instructions, and make certain decisions automatically, without direct human intervention throughout the contractual process.

However, the considerable acclaim for these advancements does not obscure the reality of significant legal challenges, particularly concerning the attribution of legal personality to the intelligent electronic agent as a machine, the validity of the will expressed through it, and the determination of legal liability for its actions. These issues compel legal scholarship to reconsider certain traditional contractual concepts in order to align them with the contemporary digital environment and the rapid evolution of artificial intelligence technologies.

The significance of this study lies in the urgent need to comprehend the dimensions of the intelligent electronic agent, especially amid its accelerating adoption and its profound impact on the legal environment. The challenges of regulating this form of agency, along with the problems it raises—particularly in relation to liability, data protection, and the rights of contracting parties—necessitate an in-depth examination to harmonize technology with contemporary legal frameworks, thereby ensuring the safe and effective utilization of artificial intelligence.

The study aims to achieve the following objectives:

- To analyze the concept of the intelligent electronic agent and its role in artificial intelligence applications.
- To examine the contemporary legal challenges associated with the use of the intelligent electronic agent, and to explore the adequacy of existing legal and regulatory frameworks in addressing the challenges posed by artificial intelligence.
- To propose recommendations and suggestions aimed at strengthening the regime governing intelligent agents.

To address the topic, this study adopts the descriptive-analytical legal method, involving the derivation of trends, analysis of legislative texts and doctrinal opinions, their discussion, extraction of apparent implications, examination of relevant judicial decisions, and derivation of the desired conclusions. Concurrently, the comparative method is employed due to its substantial importance in highlighting legislative approaches that address this pressing issue, which constitutes an urgent necessity and a fundamental demand.

The core problem of this research thus emerges: ***To what extent do the technological developments of the intelligent agent, grounded in artificial intelligence, align with existing legal frameworks?***

To address the posed problem, the study is divided into two main sections. The first section examines the legal nature of the intelligent electronic agent, while the second is dedicated to the legal issues arising from its operation.



1. The Legal Nature of the Intelligent Electronic Agent

The intelligent electronic agent is an information program based on artificial intelligence technologies, possessing the capacity to act or respond independently—either wholly or partially—on behalf of its user.

Given that the actions performed by this agent resemble, to some extent, human actions, the question has long arisen as to whether it is possible to confer legal personality upon it, with the attendant consequences—most notably capacity, which would grant it the competence to conclude legal acts, thereby relieving the human operator of liability. Alternatively, it may remain merely a technical means of communication, subject in all its acts to the will of its users, thereby safeguarding the rights of the contracting party from loss.

Through this section, the study addresses this problem by examining the possibility of the intelligent electronic agent possessing legal personality (firstly), or its characterization as merely a means of communication (secondly).

1.1. The Possibility of Granting Legal Personality to the Intelligent Electronic Agent

Conferring independent legal personality upon the intelligent electronic agent necessitates arranging all the resulting legal consequences, thereby enabling it to acquire rights and bear obligations, and granting it a degree of autonomy in performing legal acts. However, the question persists as to whether such personality can be recognized for it, or whether it remains merely a technical tool in human hands, with the effects of its acts attributed to the user or the party concluding contracts through it. In this regard, legal doctrine has divided into two main approaches.

1.1.1. The Approach Rejecting the Granting of Legal Personality to the Intelligent Electronic Agent

This approach holds that the intelligent agent cannot be granted legal personality, as it is merely a means of communication in the hands of the user, akin to a telephone, fax, or email. The will embodied in the intelligent agent is fundamentally the will emanating from the user; absent this human will, the intelligent electronic agent would not have been programmed to respond or conclude the legal act. Thus, the intent to contract on the part of the intelligent agent exists merely upon its deployment to perform its tasks or to express an offer or acceptance, as the case may be. In such cases, the user of the intelligent agent is deemed to have implicitly committed to all acts issued by the agent (Hawaikesh, 2024, p. 94).

This approach further supports its position with the concept of legal fiction, according to which all acts issued by the intelligent agent—and the transactions resulting therefrom—are attributed to the user, who is bound by them and bears their consequences, even if unaware of them or of the conditions under which they were concluded. The relevant will is thus that of the user, with the intelligent agent acting in accordance with instructions. Linking the act issued by this machine ("the intelligent agent") to the will of its human user is essential. Moreover, characterizing the intelligent agent as a means of communication represents one of the simplest and most practicable solutions (Hawaikesh, 2024, p. 94).

1.1.2.2. The Approach Supporting the Granting of Legal Personality to the Intelligent Electronic Agent



Advocates of this approach argue for the necessity of granting the intelligent electronic agent legal personality, thereby enabling it to bear obligations, acquire rights, and express its will in a legitimate and valid manner. This approach presents several arguments in support of its position, including:

- **Analogy to the legal personality of juridical persons:** Some scholars contend that the legal status of the intelligent agent should fall within the scope of legal personality enjoyed by companies. Consequently, legal personality could be recognized by integrating the intelligent agent into a company's structure as regulated by commercial law. Although, at first glance, the company and the intelligent agent appear to be distinct entities, analogy is permissible to some extent; the intelligent agent could thus be subjected to certain procedures, such as registration, to acquire juridical personality (Ahmed & Al-Arnaout, 2025, p. 144).
- **Resolving all legal problems arising from contract formation through it:** Here, consent would be that of the intelligent agent and the counterparty, or of both agents if the contract is concluded via two intelligent agents. There would also be concordance between offer and acceptance, without prejudice to the rules governing freedom of contract and contract formation (Al-Kasasbeh & Kurdi, 2013, p. 170).
- **The evolution of life in all fields has dismantled the legal linkage between human nature and legal personality:** The law's expression of "person" no longer confines itself to humanity; rather, the law now attributes legal personality to non-human entities, granting them juridical personality (sometimes termed constructive personality), independent of the personality of their constituents. Despite lacking material existence or free will to express themselves, these entities are endowed with independent personality. How, then, can such personality be denied to the intelligent electronic agent—especially since, unlike some traditional juridical entities, it is capable of expressing will automatically, rendering it in certain respects closer to a natural person than to a juridical one (Hawaikesh, 2024, p. 92)?
- **Granting legal personality to the intelligent agent provides protection to the user from the agent's technical errors:** If the intelligent agent is deemed a mere means used by a person in contracting, the user would inevitably be liable for all errors arising from the program—whether input errors, programming-related technical faults, or internet network issues as its operational environment. Conversely, if the intelligent agent is considered a legal person capable of expressing will as an agent on behalf of the user, it would bear responsibility for its errors and acts. The user could then invoke the agent's mistake, exceeding the scope of agency, or acting without authority (Ahmed & Al-Arnaout, 2025, p. 143).
- **Granting legal personality aligns with the characteristics of the intelligent agent:** These features endow the intelligent agent with capacity to conclude contracts. Such attributes provide it with fictional efficiency, enabling independent operation—not merely as a mechanical system, but with the ability to learn, acquire experience, and act based on its evaluations without referring to the principal—thus mimicking the human



mind to some extent. Moreover, three considerations may prompt the legislator to grant legal personality to the intelligent agent—the same considerations underpinning the attribution of personality to certain social entities: name, suitability, legal necessity, and social capacity. These elements can be said to exist in the intelligent agent, particularly social capacity, which enables it to interact and communicate with various individuals on the network (Hawaikesh, 2024, p. 92).

1.2. Characterizing the Intelligent Electronic Agent as Merely a Means of Communication

A segment of legal doctrine views the intelligent agent as merely a means of communication, akin to a telephone or fax. Consequently, any legal act issued by it is deemed an act issued by its user. Thus, employing an intelligent agent program to conclude commercial contracts via blockchain technology constitutes an implicit commitment by the user to all acts issued by it. In this case, the intelligent agent's role is limited to transmitting the user's will and conveying it to the other party. According to this approach, the intelligent agent's role in concluding smart commercial contracts loses its characteristic of autonomy, as the effects of contracts concluded by the intelligent agent are attributed to the user (Al-Dabousi, 2020, p. 412).

Characterizing it as a means of communication is among the simplest solutions in application, rendering the user more cautious regarding the acts the intelligent agent will perform, since such acts are attributed to him and he bears legal liability therefor. This encourages the user to exercise precision when providing the agent with the information and data required to commence its operations. Furthermore, treating the intelligent agent as a means of communication affords the third party dealing with it assurance that encourages contracting with full confidence and without fear of rights loss in the event of harm caused by the agent, as the user would be liable for such harm (Ahmed & Al-Arnaout, 2025, p. 150).

Moreover, handling the intelligent agent as a means of communication makes its user more diligent concerning the agent's acts, as they are attributed to the user, who is responsible for them. This characterization also assists the third party wishing to contract with the intelligent agent in doing so without fear of rights loss upon damage, since recourse would be had against the user for compensation, as he is responsible. Even if the user is not required to be aware of the contract terms reached by the intelligent agent with the third party, nor to refer back to the user for review of the conditions and terms before concluding the contract with the other party, the user remains liable for all the agent's acts as if they were performed personally (Al-Dabousi, 2020, p. 413).

2. Legal Challenges Arising from the Operation of the Intelligent Electronic Agent

With the rapid advancement in artificial intelligence technologies, the intelligent electronic agent has emerged as a tool reliant on algorithms to execute transactions autonomously. Despite the advantages it offers in terms of speed and efficiency, this development necessitates an examination of several core issues, particularly those related to



contractual will and legal liability. Accordingly, this section aims to shed light on these challenges and explore their future prospects.

2.1. Challenges Related to Contracting via the Intelligent Electronic Agent

The intelligent electronic agent, as a product of artificial intelligence evolution, poses a genuine challenge to traditional legal systems. Its use in transactions raises questions concerning will, liability, and the legal effects of its acts, thereby requiring a reevaluation of existing legal rules to keep pace with this digital transformation.

2.1.1. Challenges Related to Will in Contracting

Contracting through the intelligent electronic agent represents one of the most prominent manifestations of digital transformation. However, it gives rise to several legal challenges regarding the validity of will and the formation of the contract. The absence of direct human intervention in concluding the contract sparks debate over the applicability of traditional contractual concepts and rules to this new mode of contracting.

a. The Issue of Contractual Will

Will constitutes the generative force of the contract in the contractual domain. As an internal psychological state, it has no legal effect unless declared and manifested to others. Thus, the contract does not form without the expression and disclosure of will in a manner that allows the other party to become aware of and understand its content. This expression serves as the material manifestation through which will is embodied, and it need not take a specific form—it may occur through speech, writing, gesture, electronic signals, or any other means. If will remains undeclared, the meeting of the parties' wills cannot occur, and consequently, no contract is formed (Masoud Bourghda, 2019, p. 244).

Under general rules, the validity of a contract requires that contractual will emanate from persons possessing legal capacity to conclude it—an aspect easily verifiable in traditional contracting. In electronic contracting, however, the question arises as to whether consent is achieved when will or acceptance issues from an electronic agent, and even assuming the validity of such an act, the inquiry persists: in what capacity does the computer or electronic system conclude the contract on behalf of the parties?

The intelligent electronic agent falls within the scope of general rules governing the expression of will, which do not impose a specific form; it suffices that the expression clearly indicates, under the circumstances, the existence of mutual consent between the parties. Building on this principle, most legislation regulating electronic transactions explicitly permits the expression of will through electronic intermediaries and recognizes the validity of automated transactions. This aims to instill confidence and provide greater legal certainty for contracting parties, particularly in cases involving contracting between two agents.

b. The Issue of Capacity

Capacity is a condition for the validity of a contract, whereby any person who has reached the legal age for contracting may do so, unless afflicted with impediments such as insanity, mental deficiency, or prodigality. In the realm of electronic contracting, the problem of verifying the capacity of contracting parties arises, as contracting occurs between absent parties in terms of time and place. Despite requirements to disclose identity and declare data such as



age and date of birth, guarantees against circumvention by one party or assurance of full capacity remain elusive. More challenging is the uncertainty as to whether the other party is contracting with the principal or the agent—an issue that often leads to deception and misleading of the contracting party (Ibrahim, 2011, p. 173).

In this context, doctrine and law have sought solutions to the problem of contracting electronically with persons lacking capacity. Some legal scholars argue that a person lacking capacity may conclude valid and binding contracts provided they are proportionate to their financial means. Others contend that if a person lacking capacity presents the appearance of a competent adult and the counterparty is unaware of this, the principle of apparent situation (appearance doctrine) should apply to preserve the stability of electronic transactions (Diaf, 2025, p. 263).

Furthermore, the capacity of the electronic client to conclude legally binding contracts is not a substantive issue, and engaging in debate over the technical or natural capacity of the electronic client to form binding contracts would be unproductive. The real challenge posed by contracts concluded via electronic clients lies in their legal status, rather than their capacity (Masoud Bourghda, 2019, pp. 223–224).

2.1.2. The Role of the Intelligent Electronic Agent in Concluding Smart Contracts

The intelligent agent intervenes in the process of concluding smart contracts as a representative of the buyer or the seller/provider, as clarified below:

a. The Intelligent Agent as Representative of the Buyer

Acting as the buyer's representative, the intelligent agent plays a significant role in identifying the buyer's needs and searching for them. Virtual stores and manufacturing companies often require visiting consumers to provide detailed data about their identity and personality, including consumed products, social status, profession, and other information. This identifying data—or profile—is updated after each transaction by recording and analyzing successive demands, enabling retailers to offer products aligned with the consumer buyer's needs (Al-Dabousi, 2020, p. 409).

b. The Intelligent Agent as Representative of the Seller/Provider

The intelligent agent assists the seller/provider in collecting consumer data, consumption tendencies, purchasing patterns, and preferred services. This enables the seller to acquire comprehensive information about the consumer, facilitating targeted marketing of new goods and services more effectively than any other marketing method. These data can also be leveraged in every subsequent interaction with this buyer or others, providing requested goods or services with exceptional speed and high accuracy—superior to traditional search engines (Al-Dabousi, 2020, p. 411).

2.2. Liability of the Intelligent Electronic Agent

The liability of the intelligent electronic agent raises complex legal issues due to its lack of autonomous will and its status as an intelligent tool. This prompts questions about who bears the consequences of its actions in cases of error or harm, which are addressed in this subsection.

2.2.1. Contractual Liability of the Intelligent Electronic Agent



In the event of breach of contractual obligations, liability falls on the device owner, as the intelligent electronic agent is deemed merely a tool executing the user's instructions and lacking independent will separate from that of its owner. Even if the agent's will is considered to substitute for the principal's, contractual liability remains with the principal, since the agent does not generate its will independently but derives it from the programming established by the principal. However, this liability may be negated if the principal proves that the intelligent electronic agent operated beyond his control and that the breach resulted from an extraneous cause not attributable to programming or operational error (Diaf, 2025, p. 262).

2.2.2. Tort Liability of the Intelligent Electronic Agent

Tort liability arises upon the occurrence of fault causing harm to a third party. If the intelligent electronic agent errs or causes damage—whether due to a programming defect or an extraneous error—in the first case, the principal may recourse against the computer program designer, who is responsible for the programming fault. In the second case, the third party may not recourse against the principal. Additionally, a natural person unaware that the counterparty is an electronic agent may demand rescission of the contract (Diaf, 2025, p. 262).

Conclusion

In light of the foregoing analysis, it can be concluded that the intelligent electronic agent has become one of the most prominent applications of artificial intelligence, radically reshaping the digital environment. Given its extensive potential to reduce human intervention in the contracting process, it nonetheless imposes complex legal challenges that current legislation has not adequately addressed. Regulating intelligent electronic agents requires precise legislative updates that account for all issues potentially arising from interactions with them. Accordingly, this study yields the following findings:

- Granting legal personality to the intelligent electronic agent remains a highly complex matter. Although it has demonstrated in many cases its ability to stand in for humans in concluding legal acts, it cannot be said to possess independent legal personality; rather, it remains linked to the person who programmed or operates it.
- Characterizing the intelligent agent as a means of communication places full legal liability on the user, thereby protecting the third party and increasing the user's diligence in providing accurate information to the agent during contracting.
- Despite its capacity to contract, the intelligent electronic agent lacks consciousness or perception qualifying it to form genuine legal will, thereby depriving its acts of the attribute of independent will.
- The intelligent agent assists the seller in targeting consumers with products and services with greater precision and speed, thanks to the collection and analysis of their data and preferences.
- Contractual liability for breach of obligations falls on the device owner, unless proven that the intelligent electronic agent acted beyond his control. Tort liability for damages caused by the agent falls on the program designer if the error is programming-related,



and a natural person may seek rescission of the contract if unaware that the other party is an electronic agent.

Recommendations

- Introduce amendments to traditional contractual theory provisions to encompass cases where the intelligent electronic agent concludes contracts on behalf of the parties.
- Strengthen mechanisms for protecting personal data and ensuring user privacy within legal frameworks related to artificial intelligence.
- Encourage cooperation among legislators, technical experts, and legal specialists to establish a comprehensive legal framework that keeps pace with rapid developments in this field.

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