The Legal Nature of Contracts Concluded by Artificial Intelligence under Iranian and English Law

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Abstract

This article examines the legal nature of contracts concluded by artificial intelligence (AI) within the frameworks of Iranian and English law. To achieve this, it conducts a comparative legal analysis aimed at clarifying the juridical basis of such contracts. The study adopts a qualitative approach, utilizing data collected through library-based (documentary) research and applying an analytical–descriptive methodology. The findings reveal that in both the Iranian and English legal systems, when artificial intelligence functions as an electronic agent, the intelligent and autonomous characteristics of such contracts become evident. This autonomy allows contractual obligations to be executed automatically and without human intervention, thereby ensuring inflexible self-performance. As a result, the parties benefit from enhanced contractual certainty through the guaranteed execution of obligations—particularly within blockchain-based platforms. These contracts reduce dependency on financial market infrastructures, mitigate default risk, and strengthen the financial services sector due to the inherent flexibility and adaptability of AI-driven agreements. However, the comparative examination indicates notable divergences between the two systems. In English law, the moment of contract conclusion is governed by the dispatch theory of acceptance, whereas Iranian law also recognizes the reception theory of acceptance. Additionally, a difference arises concerning the determination of the time of contract formation: under English law, formation occurs at the moment the data message is dispatched, while under Iranian law, it is deemed to occur upon the signing of the document embodying acceptance.

Keywords: Artificial Intelligence; Contract; Electronic Agent; Blockchain; Iranian Law; English Law

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1. Introduction

The modern world is confronted with a surge of innovations and discoveries that have fundamentally transformed human life. Among the most notable of these developments is the rise of Artificial Intelligence (AI). In essence, AI denotes the intelligence demonstrated by machines, as opposed to the natural intelligence unique to humans and animals. It encompasses a

range of technologies that enable machines to perform cognitive tasks at advanced levels of sophistication and efficiency (Bashir, 2018).

From Alan Turing's seminal perspective, Artificial Intelligence represents the ability of machines to emulate human cognitive performance across all intellectual domains (Barton, 2024). Subsequent scholars, including Charniak and McDermott, defined AI as the study of human mental faculties through computational models, while Haugeland described it as the construction of computers capable of thought—machines endowed with reasoning abilities (Mik, 2017). Russell and Norvig later expanded this notion by defining AI as the study of human intelligence and the processes that can be artificially replicated to enable rational machine behavior (Giancaspro, 2017).

Despite the existence of diverse definitions, legal systems have not reached a consensus on the legal conceptualization of Artificial Intelligence. This hesitation arises from the multiplicity of AI's manifestations and its wide-ranging technological applications (Jones, 2019). Nonetheless, one of the most significant and increasingly common applications of AI in contemporary practice is its involvement in the **drafting and conclusion of contracts** (Dimatteo & Poncibò, 2018; Kadner Graziano, 2019).

Contracts concluded by AI systems are typically governed by the protocols of intermediary-free frameworks, in which contractual clauses are encoded, stored, and executed through blockchain technology—a decentralized ledger that ensures transparency and immutability (Clack et al., 2016; Wright & De Filippi, 2015). Unlike traditional contracts, such agreements obviate the need for human intermediaries in drafting and execution; instead, offers and acceptances are processed algorithmically. Each computational action—such as a confirmation click—activates a specific clause, thereby rendering the contract effective (Paech, 2017).

Accordingly, contracts concluded by artificial intelligence can be regarded as an advanced form of **electronic smart contracts**, distinct from both conventional smart contracts and ordinary data message agreements (Giancaspro, 2017). Whereas traditional smart contracts are pre-programmed and often inflexible, AI-based systems introduce adaptive capabilities, enabling dynamic contract formation responsive to real-time data (Vakil Moghaddam, 2019). Artificial intelligence thereby enhances the execution, monitoring, and compliance processes within smart contractual relationships (Ortolani, 2019).

Conventional smart contracts are often criticized for their rigidity and inability to handle multifaceted or evolving circumstances. At this juncture, AI intervenes as a transformative factor by enabling contracts to self-adjust based on external data inputs and predictive analytics (Raskin, 2017; Stark, 2016). Through data-driven insights, AI can identify trends, forecast risks, and optimize decision-making during negotiation and drafting phases (Barton, 2024). Consequently, AI empowers the contracting process by enhancing efficiency, certainty, and autonomy (Hodge, 2019).

Despite its technological advantages, the **legal dimension** of AI—particularly concerning the **validity and enforceability** of AI-concluded contracts—remains insufficiently defined in most jurisdictions, including Iran and England (Abedian Kalakhoran & Nejat-Zadegan, 2023; Naser & Sadeghi, 2019). In the absence of specific statutory provisions governing AI-based transactions, a pressing need arises to develop a coherent legal framework capable of addressing the unique challenges of contract formation through artificial intelligence (Naser & Razavi, 2019). Therefore, the present study seeks to analyze the legal nature and validity of contracts concluded by AI, focusing on their defining features, timing, and formation under Iranian and English law.

2. Characteristics of Artificial Intelligence Contracts

AI-based contracts possess specific attributes that allow them to replicate the functions of traditional agreements while maintaining legal validity within existing contractual frameworks (Zakeri Nia & Gholampour, 2022). These characteristics can be outlined as follows:

2.1. The Agency of Artificial Intelligence as an Electronic Agent

In AI-based contracting, the artificial intelligence system acts as an electronic agent. Under Iranian law, unlike English law, the doctrine of representation is not codified as a distinct legal regime. Instead, its principles are derived from the general provisions of contract law and the rules of agency under the Civil Code and Commercial Code (Safaei, 2003; Shahidi, 2011). A fundamental tenet in both legal systems is that no individual may be bound by a contract without their consent, an idea reflected in the principle of privity of contract (Jafari Langroudi, 2011).

In practice, when person (A) concludes a contract with person (B), the resulting legal obligations bind only those parties and their successors; third parties remain unaffected. Nonetheless, contractual will can operate either directly—when a person acts in their own name—or indirectly—when a person delegates authority to another to act on their behalf (Katouzian, 2009). For example, if (A), acting on behalf of (B), contracts with (C), the resulting legal effects are attributed to (B), with (A) functioning as the representative.

When examining the role of electronic agents in AI contracts, the central question is whether the agent must possess will to act validly on behalf of another. Since agency is a legal act that becomes effective only upon valid declaration of intent, it traditionally presupposes a human actor (Ghanavati, 2004). Furthermore, because an agent serves as the author of legal acts vis-à-vis third parties, it must fulfill all formal conditions required for a valid declaration of will (Furmston, 2012).

However, a review of the Iranian Electronic Commerce Law of 2003 reveals two divergent approaches to the legal status of electronic agents (Ghorbanvand, 2010). The first approach suggests a legislative inclination toward granting such systems limited legal personality. Clause (m) of Article 2 defines a "person" to include "natural persons, legal persons, or computer systems under their control," implying an expanded interpretation of personhood. This addition—introducing computer systems under human supervision as quasi-persons—marks a departure from traditional Iranian legal doctrine (Abhari Aliabad, 2002). Yet, when interpreted alongside Clause (v) of Article 2, which defines a computer system as a device or collection of hardware and software components executing automated data message processing, it becomes evident that such systems cannot possess independent legal personality or bear rights and obligations (Rashvand Bookani & Naser, 2019). Therefore, this statutory innovation represents not genuine personification but rather a legislative anomaly within the Electronic Commerce Law.

The second approach appears in Clause (b) of Article 18, which provides that a data message shall be attributed to the originator if "sent by an information system programmed by, or operating automatically on behalf of, the originator." This provision implies recognition of AI-driven communication as a valid act attributable to the human or legal entity responsible for its programming (Nuth, 2008). Yet ambiguity persists as to whether the electronic agent acts as a representative of the website owner or merely as a communication intermediary between parties (Abedian Kalakhoran & Nejat-Zadegan, 2023). In either scenario, the legal effects are ultimately ascribed to the originator or system owner.

Taken together, these ambiguities demonstrate that Iranian legislation has yet to establish a clear stance on the legal personality and representational authority of electronic agents. It is therefore imperative that future legal reforms address this uncertainty explicitly to ensure coherence in the legal treatment of AI-based contractual mechanisms (Kadner Graziano, 2019; Vakil Moghaddam, 2019).

2.2. The Automated Nature and Self-Execution of AI Contracts

In both legal systems under consideration, particularly in England, an AI contract is essentially a computer program with an automated component, meaning that performance may be triggered and executed—wholly or partially—without human intervention. Functionally, an AI-based contract is a species of smart contract in which code embodies and operationalizes the binding legal agreement. In this sense, an "AI legal contract" constitutes a binding instrument whose obligations are defined and/or performed automatically by a predefined programmatic architecture (Clack et al., 2016; Giancaspro, 2017).

It follows that although AI-based contracts fall within the broader family of smart electronic contracts, they remain distinct from earlier iterations of smart contracting. The principal distinction lies in self-execution. Self-enforceability was introduced as a core element of smart contracts—indeed, a central aspiration was the removal of external enforcement to secure

performance—yet, in practice, fully realized self-execution has often been elusive in legacy smart contracts (Dimatteo & Poncibò, 2018; Raskin, 2017; Stark, 2016). This gap marks the practical difference between conventional "smart contracts" and "contracts concluded by artificial intelligence": the latter more comprehensively instantiate automated performance and adaptive execution.

Historically, the earliest smart contracts operated atop the World Wide Web's largely centralized infrastructure, which enabled electronic transactions under the supervision and control of central servers. That model proved vulnerable to risks such as unauthorized access, hacking, and data manipulation. By contrast, contemporary AI-enabled contracting frequently leverages decentralized ledgers, whose transparency and distributed consensus mitigate many of those vulnerabilities while supporting native mechanisms for the storage and transfer of digital assets (Bashir, 2018; Paech, 2017; Rashvand Bookani & Naser, 2019; Wright & De Filippi, 2015).

Accordingly, the provisions of an AI-based contract are executed automatically through code, without recourse to a neutral third party or national courts. In practical terms, self-execution denotes that both the conclusion and the performance of the agreement are embedded in the parties' technical interaction rather than left to the obligor's voluntary compliance. Upon satisfaction of pre-agreed conditions—monitored and verified within the system's logic—the agreed consideration is transferred to the beneficiary without the need for additional acts to reconfirm, validate, or stage-implement performance (Giancaspro, 2017; Raskin, 2017).

AI-based contracts also incorporate internal safeguards derived from their structural design, often through implied or standardized terms engineered to secure performance. Where parties deploy efficient, code-based mechanisms that render breach prohibitively costly, contracting can proceed without resort to third-party enforcement institutions. The heightened cost of non-performance, coupled with automated verification and execution, supplies powerful compliance incentives and justifies the characterization of these agreements as "contracts concluded by artificial intelligence" (Paech, 2017; Vakil Moghaddam, 2019).

A further, frequently cited feature is the use of digital signatures. Given the formalities for issuance and the role of competent authorities in verifying an applicant's legal status, digital signature regimes structure reliance interests and assign responsibility for certain failures in identity assurance. Within this environment, AI-enabled systems can interface with signature infrastructures to automate remedies—such as withholding release of value until conditions are met or reversing transfers pursuant to programmed contingencies—although the precise allocation of risk and responsibility ultimately depends on applicable law and system design (Ghorbanvand, 2010; Law, 2001; Naser & Sadeghi, 2019; Paech, 2017).

More generally, the automated nature of contracts concluded by artificial intelligence lies in execution without continuous human intervention. This reduces transaction costs and accelerates performance: parties can finalize numerous agreements within minutes, curbing negotiation and administrative overhead while enabling real-time fulfillment (Jones, 2019; Wright & De Filippi, 2015). The efficiencies generated by code-based execution thus create strong adoption incentives.

Crucially, automated performance also functions as a preventive self-help device: machine-level enforcement reduces or displaces the need for judicial recourse. Litigation is widely criticized as costly and time-consuming; AI-enabled execution curtails those expenditures by securing performance ex ante via code (Raskin, 2017; Wright & De Filippi, 2015). On this view, certain functions traditionally served by courts—especially routine enforcement of clear, verifiable obligations—can be replicated more efficiently within programmable infrastructures.

For legal practice, AI contracting promises resource reallocation. Rather than dedicating substantial lawyer hours to drafting and iterating lengthy boilerplate, firms can concentrate on designing and validating the non-negotiable and risk-bearing provisions that must be faithfully implemented in code, reserving expert time for complex advisory work (Clack et al., 2016; Kadner Graziano, 2019).

In addition to economizing resources, self-executing design enhances contractual certainty in two related ways. First, by replacing ambiguous natural-language formulations with executable logic, AI contracts reduce semantic indeterminacy that often fuels disputes. Second, guaranteed performance—hard-wired into system logic—sustains the parties' reliance interests

by tying outcomes to verifiable conditions rather than to post hoc interpretation (Giancaspro, 2017; Wright & De Filippi, 2015).

In England, commentary indicates that the general law of contract is sufficiently flexible to accommodate AI-mediated formation and performance, although incremental doctrinal clarifications and market-standard practices will likely develop over time. The prospective applications for AI in the legal sector are broad, with especially notable implications for contract generation and lifecycle management in document-intensive industries (e.g., construction and real estate). Early evaluations emphasize both opportunities and caveats for professional use (Barton, 2024; Hodge, 2019; Jones, 2019).

Notwithstanding these advantages, limitations persist. A recurrent practical concern is stylistic and jurisdictional mismatch in AI-produced drafting—e.g., Americanized usage in documents destined for English practice—where precision is paramount and minor deviations can have dispositive effects. Moreover, trust in provenance and accuracy—usually anchored in vetted templates or bespoke law-firm precedents—may be attenuated when initial drafts are machine-generated, necessitating meticulous human review. Effective deployment therefore requires careful prompt-engineering and iterative validation, with uncertain short-run efficiency gains during the training phase (Barton, 2024).

Broader English practice concerns also endure: even where forms are "standard," the allocation of risk, responsibility, and liability must be crafted with precision to avoid unfairness and downstream disputes. Lawyers must be able to explain the meaning and implications of terms to clients; minimally supervised machine-generated texts elevate the risk of assent without full comprehension. These cautions underscore that AI is a powerful accelerator of contracting processes but not a wholesale substitute for expert legal judgment in risk allocation and client counseling (Barton, 2024; Kadner Graziano, 2019).

2.3. The Facilitating Role of the Blockchain Network in AI Contracts

The principal appeal of AI contracts lies in their capacity for automatic execution of obligations and guaranteed performance through the elimination of direct human involvement. Parties benefit from heightened contractual certainty due to the reliability of automated performance; however, this efficiency gain must be balanced against the absence of interpretive human agency. In traditional contracting, a neutral third party—such as a court or arbitral tribunal—interprets the terms in light of the parties' intent. In AI contracts, where human interpretation is absent, the blockchain network itself operates as the validating mechanism (Raskin, 2017; Stark, 2016).

Blockchain functions as a decentralized ledger that records transactions validated by nodes across a peer-to-peer network. This distributed verification process provides an independent and tamper-resistant framework for contractual execution (Bashir, 2018). Once the contractual terms and performance criteria are encoded and verified through the consensus mechanism, performance is considered final and irreversible. As Paech observes, within blockchain environments, once contractual obligations have been executed and confirmed on-chain, "no revision is possible after the performance is completed" (Paech, 2017). This "immutability" ensures that the contract cannot be unilaterally altered or frustrated by counterparties.

Blockchain's crowdsourced validation thus eliminates the potential for opportunistic behavior or biased adjudication. Whereas human participants—bankers, arbitrators, or judges—may be subject to unconscious bias or subjective discretion, the distributed ledger executes predetermined logic objectively and consistently (Mik, 2017). For this reason, parties cautious of third-party interference increasingly rely on "trustless" systems that shift trust from institutions to technology itself. By establishing, verifying, and maintaining consensus states without intermediary oversight, blockchain substitutes technical reliability for human supervision, thereby reinforcing confidence in AI-driven contracting (Paech, 2017).

2.4. The Potential Adaptability of AI Contracts

The adaptability of AI contracts demonstrates their suitability across diverse legal and commercial contexts. Their programmability enables application in domains such as shipping, aviation, energy, telecommunications, and pharmaceuticals, where immutable records and precise execution enhance operational reliability (Mik, 2017). The technology's capacity to

deliver unalterable transactional data simultaneously improves legal certainty while reducing the frequency and complexity of disputes.

In financial markets, AI contracts hold particular promise. Expressing derivatives, securities transfers, or other financial instruments in executable code can automate settlement procedures, reduce manual processing, and lower counterparty risk (Stark, 2016). Since many financial transactions are highly standardized and involve sophisticated parties, automation yields substantial efficiency gains with minimal loss of discretionary oversight. By ensuring continuous compliance and prompt execution, AI contracts help minimize settlement and liquidity risks inherent in financial exchanges (Hodge, 2019; Paech, 2017).

A prominent example is the World Bank–CBA blockchain bond initiative, which demonstrated how tokenized instruments can reduce the risk of delayed or missed interest payments while promoting transparency in capital markets. Similarly, the integration of AI-based contracting with blockchain infrastructure can reduce reliance on central counterparties (CCPs) and other financial intermediaries. In a secured transaction recorded on a blockchain ledger, if a debtor defaults, the AI-enabled contract can automatically transfer pledged collateral to the creditor, achieving instant enforcement without judicial intervention (Hodge, 2019; Paech, 2017).

Overall, these developments suggest that AI contracts do not weaken financial governance but rather enhance market efficiency and risk management. By combining autonomous execution with blockchain verification, they expand the operational frontier of financial markets and contribute to broader economic growth (Ortolani, 2019; Vakil Moghaddam, 2019).

2.5. Resolving Ambiguity in AI Contracts

One of the transformative applications of AI in legal processes is its capacity to eliminate contractual ambiguity through algorithmic precision. AI-driven systems, when equipped with programmed enforcement logic, can apply contractual clauses automatically upon the occurrence of specific conditions. For example, in a real estate sale contract, if payment is not made by the stipulated deadline, the AI system—following its coded instructions—initiates predefined enforcement measures such as deducting funds from the debtor's account or digital wallet or freezing associated crypto-assets. Similarly, in the event of defective performance or failure to deliver goods, the algorithm may trigger restitution mechanisms or confer remedial rights upon the counterparty (Naser & Sadeghi, 2019).

By codifying conditional obligations, AI contracts reduce reliance on judicial interpretation of vague or ambiguous language. The programmed logic translates abstract clauses into deterministic rules, leaving minimal scope for discretionary adjudication. This not only accelerates enforcement but also provides legal predictability consistent with parties' initial intent (Dimatteo & Poncibò, 2018; Giancaspro, 2017).

2.6. Precise and Complete Contract Execution

A pivotal innovation underpinning AI-driven contracting is the integration of **oracles**—information systems that bridge decentralized blockchain environments with external real-world data. Oracles enable AI systems to retrieve verified information from centralized databases, such as government registries, financial institutions, or judicial records (Zakeri Nia & Gholampour, 2022). By providing real-time access to data on market prices, party capacity, court judgments, and transaction histories, oracles ensure that contractual performance remains accurate and responsive to external developments.

When indicators of bad faith arise—such as inconsistencies between reported and actual performance—the AI system can automatically notify the competent supervisory authority, establishing a form of algorithmic governmental oversight over smart contracts. This linkage between blockchain platforms and regulatory agencies introduces a hybrid governance layer that combines decentralization with compliance monitoring (Abedian Kalakhoran & Nejat-Zadegan, 2023).

Within this structure, enforcement no longer depends on centralized judicial authorities but on collective validation by network participants. The consensus of these nodes guarantees accurate execution of contractual duties; failure to perform results in immediate, code-based consequences—such as suspension of digital keys or reallocation of assets (Paech, 2017;

Wright & De Filippi, 2015). Consequently, AI-enabled contracting embodies a paradigm in which computer code supersedes traditional legal mechanisms, ensuring precision, transparency, and efficiency in the fulfillment of obligations (Bashir, 2018; Mik, 2017).

3. Time and Place of Formation of AI Contracts

Prior to the emergence of electronic communication technologies, contracts were traditionally executed in a single physical session, where mutual consent was achieved simultaneously between the parties. However, with the exponential growth of information and communication technologies (ICTs), particularly over the past few decades, remote communication tools have facilitated the conclusion of contracts in non–face-to-face settings. The expansion of electronic and automated contracting has introduced new complexities concerning the time and place of formation, which were previously determined by the moment of mutual consent and the place of signing (Clack et al., 2016).

The advent of artificial intelligence in contract formation—while offering remarkable efficiency and accuracy—has complicated these classical principles, particularly regarding when and where an AI-based contract is formed. Historically, determining the time and place of contract formation was straightforward: the location of signing was deemed the place of formation, and the moment of communicated acceptance marked the time of formation. Today, with contracting parties often separated across continents, using asynchronous digital systems and diverse communication channels, identifying the precise moment of formation presents a significant legal challenge. The following discussion examines this issue comparatively in English and Iranian law.

3.1. The Time and Place of Formation of AI Contracts in English Law

Under English law, a distinction is traditionally drawn between instantaneous and non-instantaneous modes of communication (Kadner Graziano, 2019). For contracts formed through instantaneous communication—including those concluded via artificial intelligence platforms—the doctrine of receipt applies. In contrast, for non-instantaneous communications, such as postal correspondence, the postal rule (also known as the dispatch rule or mailbox rule) governs, according to which acceptance becomes effective at the time of posting, not upon actual receipt by the offeror (Ghorbanvand, 2010).

This principle was firmly established in the landmark case *Adams v Lindsell* (1818), where the court held that contractual effectiveness could not depend on the offeror's awareness of acceptance, as this would create an infinite regress—requiring awareness of awareness—making contract formation by post impracticable. Consequently, the offeror was bound from the moment the letter of acceptance was posted, a doctrine later reaffirmed in *Household Fire and Carriage Accident Insurance Co. v Grant* (1879) (Gregory, 1999).

Although the Electronic Communications Act 2000 implemented the UNCITRAL Model Law on Electronic Commerce, it did not codify the precise rules governing the dispatch and receipt of data messages in AI or electronic contracts. Instead, English law continues to rely on judicial precedent and general principles of contract formation (Law, 2001). The Law Commission of England and Wales emphasized that separate legislative incorporation of the Model Law's procedural theories was unnecessary, as English contract law possesses sufficient doctrinal flexibility to accommodate electronic contracting, including AI-mediated transactions (Law, 2001).

The Electronic Commerce (EC Directive) Regulations 2002, implementing Article 11 of the EU E-Commerce Directive, address online transactions but do not alter the fundamental doctrines of contract formation. Regulation 11 requires service providers to acknowledge receipt of an order; however, this "acknowledgement" is understood as merely confirmatory, not constitutive of acceptance, and therefore has no independent legal effect in determining formation (Nuth, 2008).

Judicial reasoning in *Anson v Trump* (1998) and *Certain Underwriters at Lloyd's London v Syrian Arab Republic & Ors* (2018) extended the traditional rule to electronic contexts: transmission is deemed complete when the message is fully received by the recipient's system, irrespective of whether its contents have been reviewed. This principle mirrors Article 15 of the

UNCITRAL Model Law and may be applied by analogy to AI-concluded contracts, where acceptance is generated and communicated automatically.

Accordingly, in English law, the time of formation for an electronic or AI contract generally corresponds to the moment of dispatch of the data message, subject to any contrary agreement between the parties. Where the offeree uses a designated information system to transmit acceptance, formation occurs when the data message leaves that system. However, where no system is designated, formation is presumed at the time the data message is transmitted successfully. Thus, the dispatch theory continues to underpin the logic of contract formation within AI-mediated exchanges (Furmston, 2012).

3.2. The Time and Place of Formation of AI Contracts in Iranian Law

The Iranian Electronic Commerce Law of 2003, modeled largely on the UNCITRAL Model Law on Electronic Commerce, establishes procedural criteria for determining the dispatch and receipt of data messages but does not explicitly regulate the time of contract formation (Abedian Kalakhoran & Nejat-Zadegan, 2023). Therefore, the issue must be examined through the lens of general contract law principles, as codified in the Civil Code of Iran.

Under Iranian law, the prevailing principle is the consensual nature of contracts, meaning that the mere concurrence of offer and acceptance suffices for formation without any formal requirement (Shahidi, 2011). In contracts concluded inter praesentes (between parties present in person), offer and acceptance occur simultaneously, leading to instantaneous formation. However, in contracts inter absentes (between absent parties), a time gap exists between declaration and communication, giving rise to debate among jurists regarding the precise moment of formation (Abhari Aliabad, 2002).

In Islamic jurisprudence, particularly among Imamiyyah scholars, the dominant view holds that a contract is concluded upon the declaration of acceptance, irrespective of the offeror's awareness. Thus, communication of acceptance is not a condition for validity (Ghanavati, 2004). Article 191 of the Civil Code supports this interpretation, stipulating that a contract is formed through the intent to create legal relations (*qasd al-insha*), thereby endorsing the declaration theory of acceptance.

Iranian jurists, however, differ on the evidentiary and practical implications of this principle. Some, such as Jafari Langroudi, argue that the diversity of contracts precludes a single theoretical approach (Jafari Langroudi, 2011). Others, including Shahidi, support the dispatch theory, emphasizing that acceptance is effective upon the transmission of the acceptance message (Shahidi, 2011). Katouzian and Safaei further suggest that dispatch marks the decisive act of acceptance, though proof of earlier intent remains admissible (Katouzian, 2009; Safaei, 2003).

Upon analysis, it may be concluded that Article 191 aligns most closely with the declaration theory of acceptance. A contract is formed when the offeree manifests a definite intent to accept—whether or not the offeror is aware of such acceptance. Consequently, dispatch of a data message is treated as strong evidence of final intent but not as a legal prerequisite for formation (Ghanavati, 2004).

Articles 26–30 of the Iranian Electronic Commerce Law specify the procedural framework for determining dispatch and receipt of electronic communications. Article 26 provides that dispatch occurs when the data message leaves the sender's system or that of an intermediary under the sender's control, and not when it enters the addressee's system. Article 27, adopting the Model Law's formulation, differentiates between cases where an addressee designates a specific information system and where none is specified.

If a designated system exists, receipt occurs either (a) when the data message enters the designated system, or (b) if delivered elsewhere, when it is actually retrieved by the addressee. If no system is designated, receipt occurs when the message enters any of the recipient's systems (Abedian Kalakhoran & Nejat-Zadegan, 2023).

In light of these criteria, and consistent with the Iranian legal system's adoption of declaration-based formation, contracts concluded through AI—whether via browserwrap or clickwrap mechanisms—are deemed formed at the moment the offeree's intent to accept is definitively expressed. In practice, this corresponds to the instant when the "I Agree" button is clicked or an equivalent affirmative digital act occurs (Ghorbanvand, 2010).

Therefore, while English law emphasizes the moment of dispatch as the determinant of formation, Iranian law, grounded in the principle of consensualism, recognizes the expression of definitive intent as the moment of formation. Both systems,

however, converge in acknowledging that AI-mediated contracts, through automated exchanges of data messages, produce binding obligations once the system registers a conclusive manifestation of assent.

4. Formation of AI Contracts

Regardless of the automated nature and self-executing characteristics that distinguish contracts concluded through artificial intelligence, legal certainty still requires determining the precise moment of formation. This determination is crucial when assessing the validity of the contract in cases involving potential defects in consent, intent, or capacity. From a jurisprudential perspective, several approaches have been proposed to define the exact time of formation of AI contracts within both Iranian and English legal systems.

4.1. Formation Simultaneous with the Declaration of Acceptance of the AI Contract

Under this approach, an AI contract is deemed formed at the very moment the offeree accesses the contract interface, reviews its terms, and signals acceptance—typically by clicking an "I Agree" or "Accept" button and authorizing the transaction through a digital or cryptographic signature. In blockchain-based systems, this signature operates as a secure private key embedded in the transaction, confirming the offeree's identity and consent (Abedian Kalakhoran & Nejat-Zadegan, 2023; Giancaspro, 2017). The declaration of acceptance, accompanied by such cryptographic verification, therefore signifies the meeting of wills and the moment of contract formation.

4.2. Formation Simultaneous with the Dispatch of Acceptance of the AI Contract

In AI-mediated transactions, dispatch occurs when the offeree's signed data message—representing acceptance—is recorded as a transaction on the blockchain network. Because each transaction must be validated by network nodes before being permanently written into a block, a brief temporal gap arises between the offeree's declaration of acceptance (the act of clicking "I Agree") and the system's actual confirmation and broadcast of the transaction (Bashir, 2018).

In practice, contract formation under this model occurs once the blockchain confirms and validates the transaction, thereby incorporating it into a new block. This process aligns with the dispatch theory of acceptance traditionally adopted in English law, according to which a contract becomes binding the moment the acceptance leaves the offeree's control and enters the technological or postal transmission system (Gregory, 1999; Kadner Graziano, 2019). Thus, for AI contracts, the dispatch moment corresponds to the recording and confirmation of the acceptance transaction on the blockchain.

4.3. Formation Simultaneous with the Receipt of Acceptance of the AI Contract

Another possible approach defines formation at the time when the offeror actually receives notification of the acceptance. In systems where the AI platform is programmed to transmit acknowledgements—via SMS, email, or direct network message—the contract is considered formed upon the receipt of that notification by the offeror (Abedian Kalakhoran & Nejat-Zadegan, 2023). This mirrors the receipt theory recognized for instantaneous communications in English law and corresponds to the Model Law on Electronic Commerce, under which formation occurs when the data message reaches the recipient's designated information system (Nuth, 2008).

4.4. The Time of Awareness of Acceptance in AI Contracts

A further refinement is the awareness theory, which identifies the moment of contract formation as the point at which the offeror becomes aware of the acceptance—whether through direct communication, system-generated notification, or blockchain confirmation. In the context of blockchain-enabled AI contracts, this moment coincides with the inclusion of the acceptance transaction in the blockchain, since it becomes publicly verifiable and immutable (Giancaspro, 2017; Paech, 2017). Once encoded and confirmed within a block, the acceptance is deemed to have achieved both transmission and legal recognition.

5. Comparative Evaluation: English and Iranian Perspectives

While the parties to an AI contract may, by mutual agreement, specify the exact moment of formation in accordance with the principle of party autonomy, absent such agreement, the determination must be made under general rules governing electronic contracts.

In English law, legislative and judicial precedents derived from the UNCITRAL Model Law on Electronic Commerce have consistently endorsed the dispatch theory for correspondence and non-instantaneous transactions. Accordingly, a contract is formed when acceptance is dispatched, not when received. Extending this logic to AI and smart contracts, formation occurs when the signature transaction—representing acceptance—is recorded and validated by the blockchain network (Clack et al., 2016; Furmston, 2012; Wright & De Filippi, 2015). This interpretation harmonizes traditional contract doctrine with the operational structure of distributed ledger technology, ensuring that legal formation coincides with technical finality.

Conversely, in the Iranian legal system, the legislature has yet to enact specific provisions addressing AI or smart contracting. Consequently, determination of the time of formation depends on interpretative doctrines developed under general contract law. Two principal theories dominate Iranian legal scholarship: the declaration theory and the dispatch theory.

Supporters of the dispatch theory, drawing analogies from postal contracts, hold that formation occurs when acceptance leaves the offeree's control—that is, when the acceptance transaction is validated and confirmed by blockchain nodes (Abhari Aliabad, 2002; Ghorbanvand, 2010). Others, favoring the declaration theory, maintain that formation occurs upon the definitive manifestation of intent—specifically, when the offeree clicks "I Agree" and transmits the private key, thereby expressing an unequivocal acceptance (Katouzian, 2009; Shahidi, 2011).

Thus, under English law, the dispatch and validation of the acceptance transaction mark the point of contract formation, reflecting the system's emphasis on transmission and technical confirmation. Under Iranian law, however, formation may occur either upon declaration or dispatch, depending on the doctrinal stance adopted. If the declaration theory prevails, the contract is formed upon the offeree's definitive consent; if the dispatch theory applies, formation coincides with blockchain validation.

In both jurisdictions, AI contracts exemplify the convergence of classical doctrines with digital realities: while English law grounds formation in technological dispatch, Iranian law continues to emphasize intent and consent, maintaining the centrality of human will even within automated contractual environments (Abedian Kalakhoran & Nejat-Zadegan, 2023; Giancaspro, 2017; Kadner Graziano, 2019).

6. Conclusion

In contemporary society, agreements and contracts form the cornerstone of social and economic interaction and are indispensable to the structure of civil life. Every individual, irrespective of status, both assumes obligations and confers them upon others through contractual undertakings. Legally, a contract represents the convergence of two or more wills directed toward producing a binding legal effect, thereby establishing reciprocal rights and obligations within a framework of legal norms—whether mandatory or supplementary—and binding the contracting parties accordingly.

In contracts concluded through the agency of artificial intelligence, the entire process—from formation to signature and confirmation—is conducted under the supervision and operational control of an AI system. Unlike conventional contracts, in which offers can be negotiated, revised, or withdrawn, the offer within an AI-based contract becomes immutable once issued. Following execution, renegotiation, fraud, and forgery are effectively precluded, as the blockchain infrastructure ensures both transparency and irreversibility. However, the practical applicability of such contracts remains limited. At present, they are feasible primarily in transactions involving the transfer of ownership or usufruct of an asset, while contracts requiring the performance or abstention from an act still necessitate human discretion and judgment.

The comparative analysis of the Iranian and English legal systems conducted in this study confirms that both jurisdictions recognize AI-based contracts as an advanced form of smart electronic contracting. These contracts operate through artificial intelligence functioning as an electronic representative, and from a technical standpoint, they are executed as autonomous computer programs. By integrating technologies such as digital signatures, cryptocurrencies, and blockchain, they create enforceable legal relationships capable of self-execution under specified conditions. Furthermore, they exhibit adaptive

capacity, resolve ambiguity through algorithmic precision, and ensure accurate and comprehensive fulfillment of contractual obligations.

Despite these similarities, significant divergences exist between the two systems concerning the time of conclusion and formation of AI contracts. Under English law, the doctrine of receipt governs instantaneous communications, while the doctrine of dispatch determines formation in non-instantaneous exchanges. In contrast, Iranian law lacks a uniform doctrinal position: while many scholars support the declaration theory of acceptance, others endorse the dispatch theory. Consequently, English law regards the contract as formed at the moment of dispatch of the data message, whereas Iranian law identifies formation with the act of signing the document or executing the acceptance, thereby marking the definitive moment at which the contract comes into existence.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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