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A Comparative Study of the Sale of AI-Based Products in Light of the International Sale of Goods Convention with a Focus on Intellectual Property Right

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Abstract

Extended Abstract

1. Introduction and Statement of the Problem

The Fourth Industrial Revolution and the advent of artificial intelligence (AI) have fundamentally transformed the nature of commercial transactions. Today, AI-based products—ranging from self-learning software and intelligent robots to diagnostic algorithms and autonomous control systems—have become an inseparable part of the global marketplace. However, traditional legal frameworks governing sales contracts, notably the United Nations Convention on Contracts for the International Sale of Goods (CISG) of 1980 and the Iranian Civil Code (rooted in Imamiyyah jurisprudence), were primarily designed for the sale of tangible and physical goods. This ontological presumption now faces a serious challenge: AI-based products are often intangible, dynamic, variable in performance, and inherently risky. They are neither traditional goods nor merely ordinary services or software. This ambiguity has caused significant confusion among courts, arbitrators, and commercial actors regarding the rights and obligations of contracting parties. This article, recognizing this deep gap between technological realities and archaic legal structures, seeks to address three fundamental questions. First, can AI-based products be considered goods within the traditional meaning of Article 1 of the CISG and Article 338 of the Iranian Civil Code? Second, in the event of malfunction or performance failure in such products, how should the boundary between non-delivery and non-conformity be determined—a distinction with entirely different legal consequences for remedies? Third, for high-risk and complex AI products, what should be the criterion for assessing conformity with the contract: initial contractual specifications, reasonable customer expectations, or behavioral standards that evolve over the product's lifecycle?

Article Info

Abstract

2. Literature Review and Research Gap

An examination of the legislative history of the CISG reveals that its drafters in the 1970s never anticipated the presence of digital or intelligent products. There is a deep divergence among member states on this issue: some (e.g., Germany and France) adopt a broad interpretation of goods, including customized software within the Convention's scope, while others (e.g., the United States, relying on Article 2 of the Uniform Commercial Code) distinguish between physical goods and software. The situation in Iranian law is even more ambiguous. The Iranian Civil Code, based on jurisprudential rules of sale, considers tangibility, economic value, and physical deliverability as essential elements of a valid sale. Iranian judicial practice, due to a strict interpretation of Article 338 and the lack of formal recognition of digital goods in e-commerce legislation, is profoundly hesitant to include AI-based products within the scope of sale. This article demonstrates that these ambiguities do not stem from an inherent deficiency in the CISG or the Civil Code, but rather from divergent interpretive roots among member states and a lack of a comparative, forward-looking approach in Iranian law. In other words, the main gap is between the interpretive capacity of existing laws and the interpretive will of judicial and legislative institutions.

3. Methodology

This research employs a descriptive-analytical method with a comparative approach. The study's scope includes legal sources related to the CISG, the Iranian Civil Code, European Union legal instruments (notably the proposed AI Liability Directive), US case law (particularly cases involving software and AI under the UCC), and English legal developments concerning smart contracts. Data collection is library-based, reviewing primary sources (Convention text, statutes, judicial decisions) and secondary sources (legal articles, expert reports). Data analysis utilizes teleological interpretation and a Rule Adaptability Test. The methodological innovation of this article lies in moving beyond a declaration of existing laws' inadequacy to instead search for hidden interpretive potential within general legal principles.

4. Main Findings

This study reaches three key findings:

Broadening the concept of goods to include AI-based products, although challenging, is possible through a broad, purposive interpretation of both the CISG and even the Iranian Civil Code. The determining criterion should not be physicality, but rather marketability as an object of transaction and determinability and deliverability. The practice of some German and Swiss courts accepting software as goods under the CISG, as well as the applicability of international trade usages (Article 9 CISG) support this claim. In Iranian law, by reinterpreting the concepts of

Article Info	Abstract
	property delivered under a contract and customary economic value, it can be argued that an AI good also possesses customary economic value and deliverability through installation, subscription, or transfer of control. In distinguishing between non-delivery and non-conformity, the primary criterion should be the reasonable usability of the product at the time of delivery. If the AI product at the moment of delivery lacks essential agreed-upon features, this is non-conformity. However, if it is fundamentally undeliverable, then non-delivery is established. Nevertheless, the dynamic, self-learning nature of AI blurs these boundaries: a defect that emerges over time due to incorrect learning from data is neither non-delivery nor traditional non-conformity, but rather a kind of post-delivery developmental defect. This article proposes that such a situation could be managed by amending Article 35 of the CISG, adding a clause regarding the duty to update and ensure accuracy in learning. The standard for assessing conformity in high-risk AI products is a combination of three criteria: (a) the technical specifications agreed in the contract; (b) external safety and performance standards and; (c) implied customary expectations of reasonableness determined considering the product's declared risk level. In Iranian law, based on Article 356 of the Civil Code (extinction of obligation upon destruction of goods before delivery) and the jurisprudential rule of destruction of goods before delivery, liability cannot simply be extinguished for the seller. In contrast, under the EU legal system, the draft AI Liability Directive introduces the concept of dynamic burden of proof and a presumption of causality for complex AI products, which could inspire Iranian law. 5. Conclusion and Recommendations This research demonstrates that both the CISG and the Iranian Civil Code, possess the capacity to be interpreted and adapted to the nature of AI-based products. However, this capacity requires a fundamental rethinking of traditional concepts such as the nature of goods, delivery, conformity, and liability. Failure to act in this area will lead to the exclusion of Iranian economic actors from global AI markets and an increase in unresolved disputes. Therefore, the following recommendations are made to the Iranian legislator: (1) amend Article 2 of the E-Commerce Law or add an article to the Civil Code to formally recognize digital goods" and AI-based products as subjects of sale; (2) inspired by the opinions of the CISG Advisory Council and EU regulations, develop dynamic conformity assessment criteria; and (3) for high-risk products, replace the traditional system of warranty against defects and eviction with a special liability regime based on defect in self-learning design. Finally, it is recommended that Iranian courts and arbitrators adopt broad, purposive interpretations of existing laws

Article Info	Abstract
	and utilize the capacity of general legal principles such as the no-harm rule and the prudent person standard to cover unforeseen cases. Technological change is unstoppable; if law wishes to remain effective, it must keep pace through intelligent interpretation and targeted reform.
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