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Legal Challenges in Ascertaining the Will of Parties in Smart Contracts

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Abstract

Smart contracts, self-executing programs on blockchain platforms, are transforming how contractual obligations are expressed and enforced. Their adoption presents complex legal challenges, particularly in ascertaining the true will of contracting parties. This paper explores doctrinal and practical difficulties in determining intent within smart contracts, examining the transformation of the autonomy of will, the legal nature of smart contracts, the expression and proof of consent, and judicial and regulatory developments. Special emphasis is placed on Uzbekistan, where legal infrastructure remains underdeveloped. Through comparative analysis and authoritative academic sources, the article proposes solutions such as hybrid contractual models, legal recognition of smart contracts as electronic transactions, and standardized frameworks to ensure fairness and enforceability.

Keywords: Smart Contracts, Autonomy of Will, Legal Consent, Blockchain Law, Contractual Intent, Uzbekistan, Civil Law, Digital Transactions

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I. Introduction

The rapid evolution of blockchain technology has introduced smart contracts self-executing agreements encoded on distributed ledgers. These digital instruments eliminate intermediaries, reduce transaction costs, and enhance transparency in contract enforcement. However, they pose significant challenges to foundational principles of contract law, particularly the determination and validation of the parties' will. In civil law jurisdictions, the expression of intent and mutual agreement forms the cornerstone of legally binding contracts. The automation and technical rigidity of smart contracts complicate the interpretation of consent, raising critical questions about the validity and enforceability of such agreements (Khan et al., 2021).

Smart contracts obscure the subjective intent of parties by reducing contractual relationships to algorithmic execution. This shift undermines traditional legal safeguards, such as protections against mistake, coercion, or undue influence, which are designed to ensure contractual justice (Bassan & Rabitti, 2024). The challenge is particularly pronounced in developing legal systems like Uzbekistan, where regulatory frameworks for blockchain-based technologies are still in their infancy. Uzbekistan has prioritized digital transformation through its "Digital Uzbekistan 2030" strategy, yet its legal doctrine lags in addressing the complexities of smart contracts, leaving gaps in enforceability and legal clarity.

This study examines the legal challenges in ascertaining the will of parties in smart contracts from a civil law perspective. The primary research question is: how can legal systems reconcile the formal precision of code with the flexible, contextual nature of human intent in contractual relations? The objectives are to explore the transformation of the autonomy of will, analyze the legal definition and nature of smart contracts, assess civil law challenges in expressing and proving intent, examine international and Uzbek legal frameworks, and propose practical regulatory solutions. By addressing these issues, the paper contributes to the growing body of literature on blockchain law and offers insights for policymakers and legal practitioners.

The significance of this research lies in its focus on bridging technological innovation with legal certainty, particularly in jurisdictions transitioning to digital economies. Smart contracts hold immense potential to streamline commercial transactions, but their integration requires careful consideration of legal principles to protect parties' rights. Uzbekistan, with its ambitious digital agenda, serves as a critical case study for examining these challenges. The following sections outline the methodology, present detailed findings, discuss implications, and propose actionable recommendations to address the legal complexities of smart contracts.

II. Methodology

This research employs a dual methodological framework, combining comparative legal analysis with formal-legal doctrinal study to provide a

comprehensive examination of smart contract regulation. The comparative approach analyzes how various jurisdictions, including the United States, the United Kingdom, Belarus, Russia, and the European Union, address the legal nature and enforceability of smart contracts. By identifying similarities and divergences in national approaches, this method highlights best practices and transferable models that can inform Uzbekistan's regulatory development. The analysis draws on legislative frameworks, judicial decisions, and scholarly interpretations to ensure a robust understanding of global trends.

The formal-legal method focuses on interpreting core legal principles, including autonomy of will, offer and acceptance, expression of intent, and evidentiary standards. This approach relies on primary sources, such as national legislation and international treaties, and secondary sources, including academic publications and legal commentaries. Seminal works by scholars provide a theoretical foundation for analyzing the interplay between technology and law. Legislative developments in Belarus, which has pioneered smart contract recognition, and U.S. states like Arizona, which have integrated blockchain contracts into commercial codes, serve as key case studies.

The research incorporates case law, judicial statements, and expert opinions to ground the analysis in practical scenarios. Contributions from Uzbek scholars offer valuable insights into local challenges and opportunities within the context of Uzbekistan's digital transformation. Due to the conceptual nature of the study, empirical data collection was not conducted. Instead, the research critically evaluates real-world legal scenarios to provide a nuanced understanding of smart contract challenges. This methodological combination ensures a thorough examination of both theoretical and practical dimensions, offering a balanced perspective on regulating smart contracts in civil law systems.

III. Results

A. Transformation of the Autonomy of Will

The classical doctrine of contract law assumes that parties enter agreements freely and with full awareness of the terms and their consequences. The principle of autonomy of will allows parties to shape their rights and obligations within the boundaries of law, reflecting their mutual intent. Smart contracts fundamentally alter this principle by embedding contractual intent into code that executes automatically without further human intervention. This transformation shifts the focus from an ongoing, dynamic agreement to a singular, coded act, imposing new constraints on how consent is expressed and maintained.

The reliance on algorithmic certainty replaces traditional trust in the counterparty with trust in the code itself. Scholars note that the will of the parties is expressed only once at the moment of code deployment (Tan & Saraniemi, 2023). This one-time act transforms contractual relationships into static, predetermined

instructions, limiting opportunities for renegotiation or adaptation. While automation enhances certainty and reduces ambiguity, it sacrifices flexibility, as parties cannot easily adjust to changing circumstances or new information. This rigidity challenges the traditional understanding of autonomy as a continuous right, raising questions about its applicability in digital contexts.

The implications of this shift are profound for civil law systems, where flexibility in contract interpretation is a cornerstone of justice. The reliance on code raises concerns about whether parties can truly exercise free will when outcomes are dictated by algorithms. For example, unforeseen events or errors in coding may lead to outcomes that diverge from the parties' original intentions, yet the immutability of smart contracts prevents correction. Legal systems must therefore reconsider how autonomy is defined and protected in an era increasingly dominated by digital execution. This transformation underscores the need for frameworks that balance technological precision with the human elements of contractual intent, ensuring that parties' rights are safeguarded in automated agreements.

B. Legal Definition and Status of Smart Contracts

Smart contracts are commonly described as self-executing agreements where terms are directly encoded into software. More precisely, they are digital contracts where rights and obligations are fulfilled automatically through a series of programmed actions. Despite clarity in technical definitions, there is no universal legal definition, leading to significant ambiguity in their legal status across jurisdictions. This lack of consensus affects the enforceability of smart contracts, particularly in civil law systems that require identifiable consent and formal legal recognition to validate agreements (Kaur et al., 2022).

In Uzbekistan, neither the Civil Code nor supplementary legislation provides a specific definition for smart contracts, creating a legal gray zone. The absence of formal recognition hinders their adoption in public and commercial sectors, leaving parties vulnerable to disputes over validity and applicable law. In contrast, countries like Belarus have taken proactive steps, legally defining smart contracts as executable software protocols that can be recognized as valid transactions. Such clarity enhances legal predictability and supports broader adoption of blockchain technologies.

The lack of a coherent legal framework undermines trust in smart contracts, particularly for complex or high-value transactions. Without statutory recognition, courts may hesitate to interpret code as binding, exposing parties to risks of unenforceability. Comparative examples suggest that integrating smart contracts into existing legal frameworks can mitigate these challenges. For Uzbekistan, defining smart contracts within its Civil Code or digital economy laws would provide a foundation for their use, aligning with the country's digital transformation goals. This step is critical to ensuring that smart contracts are both legally sound and practically viable.

C. Expression of Intent in Civil Law

In civil law systems, the expression of intent or *voluntas* is a fundamental requirement for contract formation. A valid contract demands a shared understanding of its content, typically communicated through language or formal documentation. Smart contracts, however, express intent through machine-readable code, creating significant interpretive barriers. The technical opacity of code limits accessibility for non-programmers, raising concerns about whether parties fully comprehend their rights and obligations. This challenge undermines the principle of informed consent, a cornerstone of contractual fairness (Bhawna Gulati, 2011).

Moreover, civil law systems recognize the concept of vitiated consent, such as agreements made under duress, fraud, or mistake. These categories rely on subjective context and behavioral evidence, which smart contracts typically ignore due to their reliance on code (Savelyev, 2016). The rigidity of smart contracts risks binding parties to outcomes that do not reflect their true intentions, particularly when errors or misunderstandings occur during coding. The challenge lies in ensuring that coded agreements accurately represent mutual intent, especially when parties have varying levels of technical expertise.

The reliance on code also complicates the process of verifying mutual agreement. Traditional contracts allow for negotiation, clarification, and iterative drafting, whereas smart contracts lock terms at the point of deployment. This inflexibility can lead to discrepancies between the coded terms and the parties' actual expectations. Legal systems must develop mechanisms to ensure that smart contracts reflect informed and mutual consent, such as requiring human-readable summaries alongside code. For Uzbekistan, addressing this issue is critical to fostering trust in digital transactions and ensuring equitable outcomes.

D. Proof of Consent and Evidentiary Challenges

Proving the existence of legally valid consent in smart contracts is complicated by several factors: anonymity, lack of human-readable documentation, and the immutability of blockchain systems. Blockchain's pseudonymous architecture makes it difficult to identify parties to a smart contract, as addresses do not inherently link to real-world identities. Courts may struggle to establish accountability, complicating enforcement efforts. Additionally, judges untrained in programming are unlikely to accept code as definitive evidence of intent, necessitating reliance on technical experts.

Smart contracts typically lack records of preliminary negotiations, oral agreements, or other contextual evidence of intent outside the code itself. The immutable nature of blockchain prevents filling gaps or correcting errors in agreements, further limiting evidentiary options (Ritchie & Doherty, 2025). Traditional tools, such as emails, drafts, or witness testimony, are often unavailable, shifting the burden of proof disproportionately to the party contesting the contract.

This imbalance raises concerns about procedural fairness, particularly in jurisdictions with limited judicial expertise in blockchain technology.

The reliance on code as the sole evidence of consent poses significant challenges for judicial systems. Courts must adapt to handle digital evidence while ensuring equitable outcomes for all parties. Developing standardized methods for verifying consent, such as digital identity protocols or audit trails, is essential for legal certainty. In Uzbekistan, where judicial exposure to smart contracts is minimal, training programs and expert support will be critical to addressing these evidentiary complexities and supporting the country's digital transformation agenda.

E. Judicial Practice and Institutional Readiness

Judicial systems worldwide are only beginning to grapple with the complexities of smart contract disputes. In Uzbekistan, there have been no publicly reported cases involving smart contracts, reflecting both limited adoption and judicial unfamiliarity with the technology. Comparative examples illustrate the challenges ahead. In Russia, courts have addressed electronic agreements but have yet to tackle the interpretive demands of smart contract code. In contrast, U.S. states like Arizona have legislated to recognize smart contracts as legally valid, though interpretive gaps remain unresolved (Taherdoost, 2023).

Some jurisdictions draw analogies between smart contracts and automated transactions, such as vending machine purchases, inferring consent through action rather than dialogue. However, the technical complexity of code poses significant barriers for judges untrained in programming, who may struggle to discern intent from algorithms. This lack of expertise hinders fair adjudication, underscoring the need for specialized training and the integration of court-appointed technical experts.

International examples, such as Belarus's statutory recognition of smart contracts, demonstrate that clear legal frameworks improve judicial outcomes. Uzbekistan's judiciary must build similar capacity to handle smart contract disputes as adoption grows. This includes developing guidelines for interpreting code-based agreements and ensuring access to technical expertise. Such readiness is essential for aligning Uzbekistan's legal system with its digital transformation objectives and fostering confidence in blockchain-based transactions.

IV. Discussion

The findings of this study highlight the dual nature of smart contracts as both innovative tools and legal challenges. Their efficiency and automation offer significant advantages, yet they disrupt traditional principles of contract law. The transformation of autonomy of will into a singular digital act limits opportunities for renegotiation and contextual interpretation, a cornerstone of civil law systems. The reliance on code over human intent raises questions about fairness, particularly when parties lack the technical expertise to fully understand coded terms.

This issue is not unique to Uzbekistan. Even in jurisdictions with advanced digital infrastructure, such as the United States and the European Union, regulators and courts struggle to integrate smart contracts into existing frameworks. Hybrid models, such as Ricardian contracts, which combine machine-readable code with human-readable legal text, offer a pragmatic solution (Molina-Jimenez et al., 2018). These models balance automation with interpretability, ensuring that parties can verify terms in a familiar format. Similarly, standardized contractual templates and programmer liability mechanisms can help align coded agreements with legal intent.

Judicial readiness remains a critical barrier to enforceability. The lack of technical expertise among judges complicates dispute resolution, as code-based agreements require specialized knowledge to interpret. Training programs and court-appointed experts can bridge this gap, enabling fair adjudication. Comparative examples, such as Belarus's proactive legislation and Arizona's integration of blockchain contracts, suggest that statutory clarity enhances legal predictability. Uzbekistan must adapt these approaches to its civil law context, ensuring that reforms align with local legal traditions.

The broader implications of smart contracts extend beyond technical and legal challenges. They require a rethinking of how trust, consent, and fairness are upheld in digital transactions. For Uzbekistan, the "Digital Uzbekistan 2030" strategy provides a framework for addressing these issues through targeted reforms. By defining smart contracts, establishing digital identity protocols, and creating accessible dispute resolution mechanisms, the country can foster trust in blockchain technologies. These steps will position Uzbekistan as a regional leader in digital contract law, supporting its broader economic and technological ambitions.

The global trend toward digitalization underscores the urgency of these reforms. As smart contracts become more prevalent, legal systems must evolve to accommodate their unique characteristics without sacrificing core principles (Khuan et al., 2025). Uzbekistan's relatively undeveloped regulatory landscape offers an opportunity to learn from international best practices while tailoring solutions to local needs. Collaboration between policymakers, legal scholars, and technologists will be essential to achieving this balance, ensuring that smart contracts serve as tools for innovation rather than sources of legal uncertainty.

Conclusion

Smart contracts represent a transformative step in the digitalization of contractual relations, offering efficiency, transparency, and cost savings. However, their integration into civil law systems requires careful navigation of legal challenges, particularly in ascertaining the will of parties. The transformation of autonomy of will and the rigidity of code-based execution challenge traditional notions of consent and fairness. Uzbekistan, with its nascent legal framework, faces unique hurdles but also significant opportunities to innovate.

Hybrid models, such as Ricardian contracts, and standardized frameworks can bridge the gap between technology and law, ensuring that smart contracts reflect mutual intent. Legal recognition of smart contracts as valid transactions will enhance their enforceability and foster trust among users. Judicial training and expert support are critical for addressing evidentiary and interpretive challenges, enabling courts to handle disputes effectively. By adopting international best practices and tailoring them to its civil law system, Uzbekistan can establish a robust regulatory environment for smart contracts, supporting its "Digital Uzbekistan 2030" vision and positioning itself as a leader in digital contract law.

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