



SMART CONTRACTS BEYOND THE CODE: LEGAL UNCERTAINTY AND ENFORCEMENT CHALLENGES IN RUSSIAN LAW

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Abstract - this article adopts a legal and technological perspective to examine the regulatory framework governing smart contracts in the Russian Federation. It first explores the conceptual and doctrinal debates regarding their legal nature under Russian civil law. The analysis then reviews regulatory developments facilitating their application in financial services, logistics, and public administration, with particular emphasis on integration with the digital ruble infrastructure. Notably Russian Railways pay special attention to practical use in freight transportation. The article further considers recent court decisions delineating the legal boundaries of automated contract execution and formation on digital platforms. It concludes by identifying key legal and technical limitations that restrict the broader applicability of smart contracts to standardized, low-complexity transactions. The study offers recommendations aimed at enhancing legal certainty and promoting the effective use of smart contracts in digital governance.

Keywords: smart contracts, Russian civil law, automated contract enforcement, digital infrastructure, digital ruble

1. INTRODUCTION

In the modern digital economy, businesses increasingly rely on smart contracts to automate and simplify commercial, financial, and other transactions by leveraging blockchain technology.¹ A smart contract uses a computer algorithm to establish the conditions under which parties automatically form and execute a transaction once specific trigger occur. The code runs the contract automatically and independently as soon as the parties meet the agreed conditions.²

This logic of automation first appeared in vending machines³, which dispense food, beverages, or other goods when a user inserts cash or swipes a payment card-without any human involvement. Credit kiosks allow users to sign and fulfill microloan agreements automatically. ATMs and payment terminals handle payments and settlements without requiring banking personnel. Subway and surface transportation validators enable carriers to conclude and enforce passenger carriage contracts digitally. Similarly, parking meters eliminate the need for staff in processing payments.⁴

Through mobile applications, consumers now order food, request taxi services⁵, open bank accounts, take out loans, and access a variety of services and products-all with minimal human input. This shift

¹ A. T. Miftyakhetdinov, 'Tsifrovoy rubl' kak instrument ispolneniia smart-kontrakta' (2023) 34 Voprosy rossiiskoi iustitsii 177

² K. A. Abdullaev, E. B. Abdurakhimova, S. V. Alborov et al., Aktual'nye problemy effektivnosti chastnogo prava: monografiia, ed. A. N. Levushkin and E. Kh. Nadyseva (Justitsinform: Moscow, 2022)

³ C. Kuiper and J. Neureuter, Ethereum: Advancing Blockchain with Smart Contracts and Decentralized Applications (Fidelity Digital Assets, May 2022)

⁴ K. E. C. Levy and A. E. Waldman, 'Smart Contracts and the Illusion of Automated Enforcement' (2019) 24 *Washington University Law Review* 101 at 105

⁵ Some legal scholars express the view that ride-hailing services constitute a type of smart contract (V. V. Sankov and M. V. Tegichev, 'Perevozki 2.0: kak smart-kontrakty izmeniaut pravila igry' (2023) 10 *Obrazovanie i pravo* 447). In our view, this position is unpersuasive, since unlike a smart contract, which cannot be altered during automated execution, the parameters of ride-hailing services may be modified at any time during the trip, including changes to routes, payment methods, and other conditions. In this case, mobile applications used by



toward automated execution reduces transaction costs, streamlines operations, and improves service quality. As a result, companies view smart contracts as an effective legal-technical solution for operating in digital markets.

2. Doctrinal Interpretations of Smart Contracts under Russian Law

Legal scholars continue to debate the legal nature of smart contracts. Some civil law experts interpret smart contracts as computer programs within the meaning of Articles 128 and 1261 of the Civil Code of the Russian Federation, since these contracts rely on executable software code.⁶ Smart contracts rely on executable code, but they are not simply computer programs. At their core, they are legal instruments - agreements between parties that embed obligations and performance conditions in a digital format. The software component enables execution, but legal enforceability comes from the underlying contractual intent.

Other experts define a smart contract as 'a contract in electronic form, in which the performance of rights and obligations takes place through the automatic execution of digital transactions recorded in a distributed ledger, in a strictly predetermined order and upon the occurrence of conditions specified therein'.⁷

Certain scholars regard a smart contract as a form of civil law agreement⁸, a method of contract performance⁹, or even a technical construct that does not fit within existing legal classifications.¹⁰ Some scholars describe a smart contract as a software shell inherently tied to the legal substance of the agreement, which requires assessing the parties' legal capacity and the applicable law already at the drafting stage.¹¹ Today, many experts classify a smart contract as a *sui generis* contract that falls outside traditional civil law categories and combines legal and technical features in a unique manner.

Legal scholars offer a range of perspectives on smart contracts, but reducing them to mere software code overlooks their dual nature. The code serves as the structural framework, yet the core lies in the agreed terms of the transaction embedded in that code-the legal content that gives the smart contract its binding force.¹²

Parties often treat a smart contract as an organizational-type agreement-similar to adhesion, framework, subscription, or preliminary contracts-that helps structure legal obligations. By choosing this format, they streamline business processes through automation while preserving the legal framework of the underlying transaction. Not all self-executing contracts qualify as smart contracts. Only those that use blockchain or other decentralized ledger technologies fall within the technical definition. For instance, vending machines or payment kiosks may perform automatically, but they do not provide the transparency, traceability, or distributed enforcement associated with smart contracts.

taxi operators are better understood as a means of optimizing the conclusion and performance of passenger transportation contracts, rather than as smart contracts themselves.

⁶ A. I. Savel'ev, *Pravovye aspekty razrabotki i kommerchializatsii programmnoy obespecheniya* (Statut: Moscow, 2024)

⁷ M. Iu. Iurasov and D. A. Pozdniakov, 'Smart-kontrakt i perspektivy ego pravovogo regulirovaniya v epokhu tekhnologii blockchain' *Zakon.ru* (9 October 2017)

⁸ V. V. Blazheev and M. A. Egorova (eds), *Tsifrovoye pravo: Uchebnik* (Prospekt: Moscow, 2020) 630

⁹ A. A. Volos (ed.), *Kontseptsia pravovogo regulirovaniya otnoshenii, oslozhnennykh ispol'zovaniem smart-kontraktov: Monografiya* (Prospekt: Moscow, 2021) 141

¹⁰ V. V. Blazheev and M. A. Egorova (eds), *Tsifrovoye pravo: Glossarii poniatii* (Prospekt: Moscow, 2020) 42 (Definition proposed by RAS Professor O. A. Belyaeva)

¹¹ T. Qadri, *The Role of Artificial Intelligence Systems in Smart Arbitration*, available at: <https://www.russianlawjournal.org/index.php/journal/article/view/1177> (accessed 21 June 2025)

¹² In this regard, it is worth agreeing with the position of legal scholars Iu. V. Truntsevsky and V. V. Sevalnev, who argue that a smart contract remains subject to the same body of contract law as any other agreement drafted in natural rather than programming language: Iu. V. Runtsevsky and V. V. Sevalnev, 'Smart-kontrakt: ot opredeleniya k opredelennosti' (2020) 1 *Pravo. Zhurnal Vysshei shkoly ekonomiki* 124



Smart contracts play an active role in sectors such as finance, logistics, insurance, and gaming, among other digital services. Beyond commercial use, legal scholars increasingly see these technologies as tools for modernizing the legal profession by streamlining routine tasks and improving the efficiency of legal processes.¹³

Smart contracts operate based on several core principles, including: (1) maximum automation of the transaction execution process linked to pre-programmed events; (2) immutability of the initial execution parameters; (3) transparency of all actions recorded on the blockchain and available for verification by interested parties; and (4) independence from human involvement and third-party services.

Russian policymakers explicitly promote the use of smart contracts across various sectors of the economy. Strategic programmes and legal acts adopted by the Government of the Russian Federation set out the technological and legal foundations for deploying smart contracts beyond financial services, extending into taxation, scientific research, industrial transformation, and infrastructure development.¹⁴

While doctrinal opinions vary, most agree that smart contracts represent hybrid legal-technical constructs whose enforceability depends on a combination of formal consent and automated execution mechanisms.

3. Regulatory Developments and the Digital Ruble Infrastructure

According to the Bank of Russia, a smart contract is a digital agreement that enables the automation of transaction execution and payments, as well as the control and recording of legally significant actions and events within IT systems. This definition reflects the growing legal and technological importance of smart contracts in the digital economy.¹⁵

The digital ruble initiative illustrates how regulators seek to institutionalize smart contracts within national financial infrastructure. For example, the Bank of Russia plans to introduce smart contracts as an additional feature of the digital ruble platform to streamline business processes between counterparties and reduce transaction time and costs. Clients are expected to gain direct access to smart contracts that financial institutions preconfigure and the Bank of Russia verifies. Each contract will include details about the parties, transaction amount, and execution terms. Once all parties sign the digital document, the system will register the contract on the digital ruble platform.¹⁶

Another potential use of smart contracts involves tagging digital rubles with conditions that restrict how they may be spent—for example, by limiting purchases to specific categories of goods or services—and enabling full traceability of their circulation. The regulator offers the following example of a conditional payment smart contract using digital rubles¹⁷:

- the seller and the buyer enter into a supply agreement with a condition that payment in digital rubles will be made upon the arrival of the goods at the destination;

¹³ E. Rusakova and K. Sergeev, 'Changing the Activity of a Lawyer in Civil Procedure in the Digital Age' (2024) 12(2) Russian Law Journal 200

¹⁴ See, for example, Government of the Russian Federation, Postanovlenie No. 1750 (28 October 2020), on experimental legal regimes in digital innovation; Rasporyazhenie No. 3684-r (31 December 2020), on fundamental scientific research; Rasporyazhenie No. 381-r (21 February 2020), on tax monitoring; Rasporyazhenie No. 2101-r (30 September 2018), on infrastructure development; Rasporyazhenie No. 4355-r (29 December 2022), on financial market strategy; and Ministry of Industry and Trade, Strategy for the Digital Transformation of the Manufacturing Industries (2021).

¹⁵ Bank of Russia, Main Directions for the Development of the Financial Market of the Russian Federation for 2025 and the Period of 2026 and 2027, available at: https://www.cbr.ru/Content/Document/File/141798/onrfr_2025_2027.pdf (accessed 22 June 2025)

¹⁶ Above n. 15 at 63

¹⁷ A. V. Stepanchenko, 'Digital Ruble in Russian Civil Circulation: Challenges and Perspectives' (2022) 134 SHS Web of Conferences, EURO-ASIAN LAW CONGRESS 2021, 00041 at 5, DOI: 10.1051/shsconf/202213400041



- the seller creates a smart contract via the mobile application of their servicing bank, and both parties sign it;
- the digital ruble platform registers the smart contract and initiates monitoring of its execution, including interaction with trusted external sources;
- Once the goods arrive at the destination, the platform receives a notification and automatically transfers the payment to the seller.¹⁸

The Central Bank's initiative places smart contracts at the heart of its financial modernization strategy, effectively embedding private agreements into the institutional architecture of digital currency.¹⁹

This integration of smart contracts into the digital ruble infrastructure highlights an important legal evolution. While the Bank of Russia describes a smart contract as a tool for automating payments and controlling legally significant events within IT systems, this interpretation addresses only the technical aspect. A smart contract, in legal terms, also involves an agreement between parties whose rights and obligations must conform to the principles of civil law, including consent, capacity, and lawful purpose.²⁰

Smart contracts on the digital ruble platform do not cancel legal formalities. The parties still need to agree in advance on all essential terms - such as offer, acceptance, consideration, and intent to create legal relations. The platform's use of pre-set templates raises additional concerns: can the parties adjust the terms, and how can we be sure they give informed consent when banks prepare the contract structure?

Moreover, while the example of a conditional payment illustrates efficiency, it also reveals the rigid, binary structure of current implementations. If goods arrive damaged, delayed, or in partial quantity, the contract cannot assess fairness or breach on its own. This lack of interpretive flexibility limits the use of smart contracts in transactions where performance involves qualitative standards or requires legal discretion.²¹

Thus, while the Central Bank's digital ruble project demonstrates how public infrastructure can support smart contract deployment, it also underscores the need for a clear legal framework that defines the status of such instruments, regulates their enforceability, and balances automation with contractual autonomy.²²

4. Freight Transportation, Judicial Practice, and Technical Constraints

Smart contracts hold particular significance in the field of freight transportation, taking into account the considerable market need for reliable, prompt and uninterrupted service provision.

The *Transport Strategy of the Russian Federation up to 2030*, with a forecast period extending to 2035, identifies the acceleration of goods movement and the reduction of transportation costs for cargo owners as key objectives of logistics development.²³ In this regard, the document notes that the dissemination of platform-based technologies and smart contracts will simplify interactions between participants in the transportation process eliminate intermediaries who do not create benefit, and reduce overall logistics costs.

¹⁸ Section V of the Digital Ruble Concept, issued by the Bank of Russia in April 2021, available at: https://www.cbr.ru/content/document/file/120075/concept_08042021.pdf (accessed 18 June 2025)

¹⁹ Bank of Russia, Digital Ruble Concept (April 2021), available at: https://www.cbr.ru/content/document/file/120075/concept_08042021.pdf (accessed 24 June 2025)

²⁰ See Sankov and Tegichev, above n. 5 at 450

²¹ Bank of Russia, Analytical Review on "Smart Contracts" (April 2018), available at: https://www.cbr.ru/Content/Document/File/47862/SmartKontrakt_18-10.pdf (accessed 19 June 2025)

²² See Stepanchenko, above n. 17 at 5

²³ Government of the Russian Federation, Transport Strategy of the Russian Federation up to 2030 with a forecast period until 2035, *Rasporyazhenie of the Government of the Russian Federation No. 3363-r* (27 November 2021)



These distributed platforms-referred to as logistics integrators-are expected to operate independently of any dominant market participant or governmental authority. Furthermore, the strategy envisions the establishment of data exchange channels between Russian logistics platforms and their counterparts in Asia and Europe.²⁴

Under the strategic initiative for digital transformation, the government intends to implement smart contracts using distributed ledger technologies to support legal and operational processes in the transport sector. These contracts aim to support cargo tracking and facilitate the exchange of legally significant data between transport companies and public authorities in the Russian Federation. This initiative is outlined in the Strategic Initiative for the Digital Transformation of the Transport Sector of the Russian Federation until 2030, approved by Rasporyazhenie of the Government of the Russian Federation No. 3097-r (3 November 2023).²⁵

Paragraph 2 of Article 309 of the Civil Code of the Russian Federation forms the legislative basis for smart contracts. It allows the parties to a transaction to agree that their obligations will be performed automatically when specific conditions occur, using information technologies defined in the transaction's terms.²⁶

As follows from the content of the cited legal provision, a smart contract is based on an information technology specified in the terms of the transaction and enabling the automatic performance of obligations by the parties upon the occurrence of agreed conditions. The parties to a smart contract are not required to express any additional will, since all parameters for the performance of such an agreement are set forth in the relevant computer programme agreed upon by the parties.²⁷

Russian Railways (RZD), which acts as both the owner of public-use infrastructure and the largest freight carrier within the Russian railway network, actively uses smart contracts. The legal basis for this practice, in addition to para. 2 of Article 309 of the Civil Code of the Russian Federation, is the Agreement on the Provision of Information Services and Access to Electronic Services in the Field of Freight Transportation, JSC Russian Railways, No. 2633/r (18 December 2017).²⁸

The agreement includes Annex No. 2.15, titled *Terms for the Provision of the Electronic Service for Monitoring Smart Contracts in Freight Transportation on the Distributed Data Ledger Platform*, as an essential part of its regulatory framework. This annex sets out the general parameters and procedures for delivering the service, including requirements for technical connectivity, data transmission protocols, and payment terms applicable to services rendered by the railway company.²⁹

According to paragraph 1 of the aforementioned annex, the service is provided to the client by the railway carrier using blockchain technology, pursuant to a framework agreement between the parties governing the self-execution of the contract of carriage and related agreements.³⁰

The railway carrier provides the service only if the necessary technological capacities are available and the agreement does not impose any restrictions. Certified information security tools ensure secure access. Depending on the role assigned to each transport participant, clients can view the following categories of information:

- core operations within the freight transportation process by rail;

²⁴ *Ibid.*

²⁵ *Government of the Russian Federation, Strategic Initiative for the Digital Transformation of the Transport Sector of the Russian Federation until 2030, Rasporyazhenie of the Government of the Russian Federation No. 3097-r (3 November 2023)*

²⁶ *Civil Code of the Russian Federation, Art. 309(2)*

²⁷ *Ibid.*

²⁸ *JSC Russian Railways, Agreement on the Provision of Information Services and Access to Electronic Services in the Field of Freight Transportation, No. 2633/r (18 December 2017)*

²⁹ *Ibid.*, Annex No. 2.15

³⁰ *Ibid.*, Annex No. 2.15, para. 1



- occurrence of events related to the performance of contractual obligations;
- facts of the occurrence and amounts of financial obligations of the transport participants arising in the course of transportation;
- normative and reference data;
- Archival records.³¹

Judicial practice demonstrates that, in the resolution of property disputes between participants in the freight rail transportation market, courts take into account the data generated by the smart contract monitoring service to which the client has acceded. In particular, this includes information on idle time (dwelling), movement of rolling stock on public and private tracks, wagon turnover, and other indicators related to the use of railway rolling stock.³²

Courts have interpreted the Agreement on the Provision of Information Services and Access to Electronic Services in the Field of Freight Transportation, including Annex No. 2.15 Terms for the Provision of the Electronic Service for Monitoring Smart Contracts in Freight Transportation on the Distributed Data Ledger Platform, as an offer within the meaning of Articles 434-435 of the Civil Code of the Russian Federation.³³

Given that the client voluntarily acceded to the above-mentioned agreement, courts, when resolving property disputes between the client, the railway carrier, and other freight market participants, accept calculations of claims for outstanding charges related to the excess dwell time of wagons on railway tracks. These calculations are generated by the electronic smart contract monitoring service. This approach was confirmed, *inter alia*, in the decision of the Arbitrazh Court of Moscow dated 16 August 2022 in Case No. A40-22612/22-131-226.³⁴

A key feature of a smart contract is its automatic execution based on a specific information technology and the impossibility of altering the terms agreed therein. At the same time, before initiating the execution procedure of a smart contract, the parties must in any event agree on all essential terms of the transaction.

In one case³⁵, a buyer placed an order for a car on the website of a car dealer using a “smart contract” service, but then received a notification from the seller stating that the sale and purchase agreement for the selected vehicle could not be concluded. The notification indicated that the vehicle the buyer was interested in had been designated by the seller as part of a demonstration fleet and, for that reason, could not be offered for public sale.

The seller also stated that an error had occurred when compiling the list of vehicles available for sale. The buyer disagreed with the seller’s position and filed a lawsuit seeking to compel the seller to enter into a sale and purchase agreement for the selected vehicle model.

The court rejected the claim, reasoning that the advertisement published on the seller’s website was merely intended to inform potential buyers of the possibility of purchasing a vehicle and did not constitute a finalized agreement or an offer.

The seller’s website included a disclaimer stating that all prices were for informational purposes only and that the advertisement of goods did not, under any circumstances, constitute a public offer

³¹ *Ibid.*

³² See e.g. data from the smart contract monitoring service under Annex No. 2.15 of JSC Russian Railways, Agreement on the Provision of Information Services and Access to Electronic Services in the Field of Freight Transportation, No. 2633/r (18 December 2017)

³³ Civil Code of the Russian Federation, Arts. 434-435, 438

³⁴ Decision of the Arbitrazh Court of Moscow, Case No. A40-22612/22-131-226, 16 August 2022

³⁵ Decision of the Second Cassation Court of General Jurisdiction, 25 April 2022, Case No. 88-9830/2023.



within the meaning of Article 435 of the Civil Code of the Russian Federation³⁶. The disclaimer further clarified that all information was provided for reference purposes and was not exhaustive.

In resolving the dispute, the court also referred to the clarifications set out in paras 7-8 of the Resolution of the Plenum of the Supreme Court of the Russian Federation No. 49 (25 December 2018), *On Certain Issues Related to the Application of the General Provisions of the Civil Code of the Russian Federation on the Conclusion and Interpretation of Contracts*.³⁷

As a general rule, an offer must include the essential terms of the contract and clearly express the intention of the offeror to consider themselves legally bound by the contract upon its acceptance by the offeree.³⁸

If a proposal to conclude a contract is addressed to a specific person and contains terms sufficient for the conclusion of such a contract, the intention of the sender to be bound by the contract with the addressee is presumed, unless the proposal itself provides otherwise or the circumstances in which it was made indicate otherwise.³⁹

The terms of a contract may be determined by reference to standard contract provisions (The Civil Code of the Russian Federation, s. 427), to terms previously agreed upon during negotiations, or to those contained in a previously concluded preliminary agreement (s. 429) or framework agreement (s. 429.1).⁴⁰

A proposal to conclude a contract that is addressed to an indefinite number of persons shall not be regarded as an offer if it does not indicate that the sender intends to be bound by a contract with anyone who accepts such a proposal. For example, a product advertisement is not considered an offer⁴¹.

As the seller in the case at hand did not place a public offer on its website and the parties had not agreed on all essential terms of the sale and purchase agreement, the buyer had no right to demand that the court impose on the seller an obligation to conclude the specified contract⁴².

These limitations become critical in transactions involving discretionary judgment, variable obligations, or complex regulatory requirements. Smart contracts are poorly suited for such contexts, as their binary logic cannot account for ambiguity or negotiated adjustments. Long-term agreements, regulated asset transfers, or service contracts with performance standards typically require human interpretation and oversight.

Despite the widely acknowledged advantages of smart contracts-such as simplicity, operational speed, elimination of intermediaries, and new business opportunities-it is necessary to address the limitations of this legal instrument. According to para. 3 of the *Analytical Review: Smart Contracts*, prepared by the Bank of Russia (April 2018)⁴³, the following key disadvantages are identified.

- absence of functional flexibility, which restricts the parties' ability to engage in negotiations when amending or supplementing the smart contract, taking into account specific circumstances, or opting out of liability measures;

³⁶ *Civil Code of the Russian Federation, Art. 435*

³⁷ *Supreme Court of the Russian Federation, Resolution of the Plenum No. 49 "On Certain Issues Related to the Application of the General Provisions of the Civil Code of the Russian Federation on the Conclusion and Interpretation of Contracts" (25 December 2018)*

³⁸ *Civil Code of the Russian Federation, Art. 432(1)(2)*

³⁹ *Civil Code of the Russian Federation, Art. 435(2)*

⁴⁰ *Civil Code of the Russian Federation, Arts. 427, 429, 429.1*

⁴¹ *Civil Code of the Russian Federation, Art. 437(1)*

⁴² *Second Cassation Court of General Jurisdiction, Decision in Case No. 88-9830/2023, 25 April 2022*

⁴³ *See Bank of Russia, Analytical Review on "Smart Contracts", above n. 21*



- functional flexibility, which restricts the parties' ability to engage in negotiations when amending or supplementing the smart contract, taking into account specific circumstances, or opting out of liability measures;
- incorrect functioning of the program code underlying the smart contract, which in practice may result in improper performance of its terms or enable fraudulent actions;
- the complex process of creating a smart contract, which may lead to additional difficulties in encoding and accounting for a wide range of conditions within its program, such as the condition of goods during transportation, customs procedures, and others.

As judicial practice demonstrates, while smart contracts reduce transaction costs, their rigidity and dependence on correct technical implementation limit their suitability to routine, low-complexity operations.

In addition to technical vulnerabilities, smart contracts raise significant legal concerns that current regulation has yet to fully address.

5. Structural Legal Challenges and Regulatory Gaps

The first challenge stems from their immutability. Once deployed, a smart contract cannot be altered, even if both parties would benefit from modification due to unforeseen circumstances such as force majeure. In conventional contracts, the parties or a court may adapt the agreement to reflect changed conditions. Smart contracts lack such flexibility, which may impair the ability to uphold principles of fairness, proportionality, or good faith in contractual performance.⁴⁴

Cross-border use introduces further complexity. When a smart contract connects parties from different jurisdictions, identifying the applicable law and competent forum becomes problematic—especially when the contract's code does not explicitly specify these parameters. Since many smart contracts omit express clauses on choice of law or venue, disputes may fall into legal gray zones. One way to address this issue is by mandating that legally enforceable smart contracts contain metadata indicating governing law and jurisdiction, or by integrating standardized clauses through smart contract libraries verified by regulatory bodies.⁴⁵

Another unresolved question is liability. If a smart contract executes incorrectly due to a coding error, it remains unclear whether the developer, the deploying party, or the counterparty bears legal responsibility. This legal vacuum may leave injured parties without recourse and reduce trust in smart contract deployment. Regulators may consider clarifying the status of developers as either service providers, agents, or independent contractors, and impose minimum requirements for professional accountability.⁴⁶

Not all contracts are suitable for smart contract implementation. Complex transactions involving subjective evaluation, regulatory licensing, or layered negotiations—such as real estate sales, licensing of intellectual property, or investment agreements—typically require contextual interpretation and discretionary judgment. Attempts to codify such arrangements in rigid automated logic risk oversimplifying legal relationships and increasing the likelihood of disputes.⁴⁷

To address these challenges, legal reform must go beyond general recognition of smart contracts and establish practical safeguards. Legislators and industry bodies could introduce model smart contract templates for common transaction types, such as sales of goods, transport arrangements, and escrow

⁴⁴ D. Drummer and D. Neumann, 'Is Code Law? Current Legal and Technical Adoption Issues and Remedies for Blockchain-Enabled Smart Contracts' (2020) 35 *Journal of Information Technology* 337;

⁴⁵ S. Greenstein, 'Choice of Law in Smart Contracts: Metadata and Jurisdictional Challenges' (2023) 27 *International Business Law Review* 122

⁴⁶ G. Richardson, 'Standardization and Legal Templates in Smart Contracts' in R. Brown (ed.), *Technology and Contract Law* (Oxford University Press: Oxford, 2023) 201

⁴⁷ N. Ballaji, 'Smart Contracts: Legal Implications in the Age of Automation' (2024) 18 *Beijing Law Review* 1022 at 1025



operations. These templates would ensure legal completeness, facilitate standardization, and reduce drafting errors.⁴⁸

In addition, setting qualification standards for developers who write legally significant code could increase reliability. Requiring formal certification, legal-technical training, or participation in recognized audit programs would help prevent errors and clarify responsibility. Finally, the development of blockchain-based dispute resolution mechanisms—often referred to as smart arbitration—could provide an effective remedy in cases of disagreement. These systems use predefined logic and independent oracles to assess compliance and render binding decisions. While not suitable for all types of disputes, smart arbitration could offer a transparent and low-cost option for resolving conflicts within digital ecosystems.

6. CONCLUSION

Given the limitations and risks associated with smart contracts, parties should primarily use them to automate routine and low-complexity transactions governed by standardized procedures and clearly defined algorithms.

Russian legislation additionally requires participants in civil transactions to generate original accounting documents in paper form, record them internally, and submit them to tax authorities or other competent bodies upon request. This regulatory obligation reduces the convenience and perceived reliability of smart contracts in certain business contexts.

The Concept for the Development of Machine-Readable Law Technologies, adopted by the Government Commission on Digital Development and the Use of Information Technologies to Improve the Quality of Life and Business Conditions (Minutes No. 31, 15 September 2021), provides a working definition of a smart contract. It describes a smart contract as a segment of software code that implements algorithms designed to execute elementary transactions and routine operations forming the substance of agreements. These include actions such as fund transfers and the submission of reports. The definition also encompasses contracts concluded using distributed ledger technologies or other technical solutions that enhance the reliability of contractual performance.⁴⁹

Where the performance of complex transactions is required—particularly those involving multiple or mutually exclusive execution scenarios—the use of smart contract technology may prove problematic. Its application in such cases may entail adverse consequences for the parties, especially given that not all possible outcomes can be anticipated in advance.

To move beyond pilot implementations and realize the full potential of smart contracts, Russian regulators must go further than issuing conceptual frameworks. A legally binding and technologically integrated regime should define the permissible scope of automated execution, establish mechanisms for human override in ambiguous or exceptional situations, and clarify liability rules in the event of failure. Without such a regime, smart contracts risk remaining confined to narrowly defined use cases, unable to support the complexity of real-world commercial relationships in a reliable and legally secure manner.

To support responsible adoption, legislators and standard-setters should take a proactive role in shaping the conditions under which smart contracts may operate. Priority areas include: (i) the development of model clauses and certified libraries for frequently used transaction types, such as sales of goods and digital escrow; (ii) the creation of qualification frameworks for smart contract developers, ensuring technical competence and legal awareness; and (iii) the establishment of

⁴⁸ D. B. Garrie and G. A. Andler, 'Arbitrating Smart Contract Disputes' (2024) 12 Stanford Journal of Blockchain Law & Policy 87;

⁴⁹ Government Commission on Digital Development, Concept for the Development of Machine-Readable Law Technologies, Minutes No. 31 (15 September 2021), available at: <https://digital.gov.ru/uploaded/files/kontseptsiya-razvitiya-tehnologij-mashinocitaemogo-prava.pdf> (accessed 19 June 2025)



blockchain-based dispute resolution procedures-such as smart arbitration-that combine efficiency with procedural safeguards. Without these foundational tools, smart contracts will remain limited to narrow, low-risk applications and fail to deliver their promised value in more complex legal and commercial environments.

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