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## The concept of a smart contract: advantages and current situation of legal regulation in the Republic of Kazakhstan

In the article the current provisions of the legal regulation of smart contracts were outlined, the relevance of which will grow as such contracts spread in various spheres and areas of life. Thus, the main problem of regulating relations on the use of a smart contract is the ambiguity of its legal essence, the lack of regulation in legislation, including in the Civil Code of the Republic of Kazakhstan. At the same time, some advantages of a smart contract are clearly shown by examples, which will help facilitate the process of concluding, changing, terminating and executing contracts. The main advantages of a smart contract are also discussed in detail, such as automation, transparency, security, efficiency, low intermediary costs, decentralization, flexibility and programmability. In the research, the authors touched upon the problems of fulfilling obligations in debt relations, the potential advantages and assistance of a smart contract in enforcement proceedings. The result of the exploration is a formulated definition of a smart contract and the identification of specific potential advantages of this type of non-traditional contracts. The authors summarize the results, noting the absence of a legal definition of a smart contract in the legislation of the Republic of Kazakhstan, the exclusively declarative nature of its legal regulation; the ambiguity of the range of public relations where contracts in this form are applicable, which does not allow the widespread dissemination and use of a smart contract.

**Keywords:** blockchain, smart contracts, digitalization, innovative technologies, automation, information technology, e-commerce, Ethereum, Solidity, cryptography.

### Introduction

The process of digitalization and the introduction of new innovative technologies is actively underway in Kazakhstan. This is important for economic growth and the overall development of the entire state. Kazakhstan has already achieved significant success in the field of IT.

On September 1, 2023, in a message to the people, President of the Republic of Kazakhstan Kassym-Jomart Tokayev stressed the need to transform Kazakhstan into a country with a developed information technology infrastructure (IT country), saying the following: “We already have achievements in the field of digitalization — we are among the world leaders in the e-government and financial technology development index. The volume of exports of the domestic IT industry increased fivefold last year alone. By the end of this year, this figure may reach \$500 million. But this is not the limit either”, the President said [1].

One of such important IT industries at the global level is, of course, blockchain technologies, including smart contracts. New concepts and phenomena related to the development of technology are becoming more widespread and familiar. For example, cryptocurrencies and bitcoins, most people may have heard about them a lot, but have only a superficial idea about them. While many of us may not know some technological terms such as blockchain, token, smart contracts, node, mining, verification, validation, hash code, fiat currency and others, these concepts are widely known to those who are deeply immersed in modern technologies.

As noted by M.K. Suleimenov, Doctor of Law, Professor, unfortunately, even among highly qualified lawyers, especially among civilists, there is a lack of understanding of some technological terms. Unlike the rest of the population, it is important for lawyers to master some key concepts, since they have a significant impact on the legal sphere, thereby requiring special attention and expertise. Lawyers must anticipate global

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development trends in advance in order to make timely changes to legislation and effectively regulate legal relations in society. One of such important concepts is smart contracts now [2].

Thus, the purpose of this research is, on the one hand, to explore the concept of the term “smart contract”, to identify its advantages, on the other hand, to analyze and pay attention to the current situation of legal regulation of smart contracts in the Republic of Kazakhstan. The author set tasks to determine the legal nature of a smart contract, identify its key advantages, develop a theoretical model for an example, and also show the effectiveness of a smart contract in enforcement proceedings.

### *Research methods and materials*

The main research methods of the article are methods of analysis, synthesis, deduction, induction and systematization. An extensive exploration on the main advantages of a smart contract has been conducted, and we have made the switch from general theory to specific examples. A theoretical model of a smart contract has been developed for concluding a housing purchase and sale contract.

Within the framework of this research, general scientific, private scientific and private law methods were used, since the topic of smart contracts affects many areas and branches of legal science.

The conducted exploration has shown that a smart contract is a term closely related to the IT sphere. In the issue of researching the legal nature of a smart contract, the analysis of scientific papers is paramount.

When writing the article, the authors used the works of domestic legal scholars and foreign authors. The following authors should be noted: M.K. Suleimenov, N. Szao, M. Krosby, D.A. Kopylov, E.N. Yeletsky, A.A. Maksimovskaya and others.

### *Results*

New technologies and innovations open up new opportunities for digitalization of various sectors of the economy and public life. Smart technologies and solutions facilitate many processes, as well as generally improve the quality of life. The rapid development of human thought gives its results in various fields, and jurisprudence is no exception. One of the new innovative technologies in this industry is, of course, the smart contract. Like any new scientific term, it needs to be studied, to understand the concept, and also to find out how it will be useful to society. However, before moving on to the smart contracts themselves, we need to briefly understand the term blockchain. Since it is currently the basis and foundation of smart contracts.

Blockchain is a distributed database that records transactions in the form of ordered blocks. Each block contains a unique identifier (hash) of the previous block and its own transactions. The blocks are interconnected and form a chain, which gives resistance to changes. Blockchain works in a decentralized system where network participants confirm and record transactions, ensuring transparency, reliability, and lack of necessary centralized control. Blockchain technology can be applied in various fields such as finance, supply chain, cryptocurrency, healthcare, and to create smart contracts [3].

The term smart contract was first used by Nick Szabo in 1994, although it became widespread and popular after the advent of blockchain and cryptocurrencies (for example, such as Ethereum) [4]. The code that is programmed lies in the base of the smart contract, defines the terms and conditions of the transaction. It is stored in a chain formed from blocks and is executed automatically, if the specified conditions are met. This ensures automation and decentralization in the execution of contracts. Blockchain technology and smart contracts based on it represent a completely new solution in the ways of execution and enforcement of digital agreements. Software codes can be run on blockchains that will ensure the fulfillment of the terms of the agreements between the parties without any intermediaries. The benefits and advantages of such agreements cover various spheres of life — from the financial sector to jurisprudence.

Smart contracts have a number of advantages in various industries due to their secure, decentralized and automated processes. In order to understand the essence and benefits of this unconventional type of agreement, it is necessary to consider its main advantages.

**Automation of processes.** Auto-execution of predefined actions when certain conditions are fulfilled is the basis of a smart contract. This reduces the need for intermediaries and manual intervention, which optimizes processes and increases efficiency. The key to automating smart contracts is to clearly define the conditions under which an agreement must be fulfilled. Such conditions may include various events or positions that can be checked automatically. Logic or a set of actions are introduced into the program, they must be fulfilled if the terms of the contract are met. These may include transferring funds, writing data to the blockchain, activating another smart contract, etc.

In order for a smart contract to interact with external data (for example, weather, currency exchange rates, etc.), oracles are used. They can show external data in the blockchain, which seems to be very useful when programming a contract condition.

The necessary components of smart contract automation are testing and deployment. When the smart contract code is written, it is thoroughly tested for security and effectiveness. Only after this procedure, it remains on the blockchain for use.

After successful testing, smart contracts can perform various actions to automatically perform tasks such as: making a transfer of funds after a certain period and (or) fulfilling a certain condition; making automatic payment of insurance compensation upon the occurrence of an insured event, and much more. Automation of agreements improves efficiency, creates a trusting and transparent environment for various business processes and, of course, reduces risks [5].

**The transparency of a smart contract** is ensured due to the fact that the terms and transactions of the contract are written directly in the blockchain, thus forming a clear and unchangeable ledger. The parties can check the execution of the agreement at any time, this reduces the risk of fraud.

The positive position of smart contracts that we are discussing is achieved by providing each interested counterparty (network parties) with access and understanding of the code and logic of the contract. Thus, developers and participants can analyze and verify the security of a smart contract, making sure that the contract fulfills only what is expected of it. All operations (status and transactions) of the smart contract can be seen in the public blockchain. That is, any party to the agreement can freely check all changes and actions. All information about the contract is available in real time and can be easily verified at the right moment. The system provides a view of the current status of the smart contract, and the history of its use is also easily tracked [6].

Decentralized nodes maintain and verify the status of the contract. There is no single control point, which in turn increases the loyalty of the parties to each other. Such a consensus contributes to the fact that information about a smart contract becomes unambiguous and consistent, which eliminates ways of manipulation, as well as falsification of data.

Transparent and open system of counterparty interaction opens up great prospects for blockchain technology and smart contracts, helps their widespread adoption and use in society. Trust is a very important component in agreements, and we note that smart contracts do an excellent job with this task [7].

Thanks to the blockchain technology, which is based on smart contracts, the **security of the agreement** is achieved. Because blockchains are inherently secure and resistant to hacks and unauthorized system interventions. The decentralization of blockchains makes it difficult to manipulate a smart contract or violate its confidentiality.

The fact that a smart contract has a programmatic nature and is directly involved in the execution of financial transfers, as well as the fact that it performs many important operations in the blockchain makes its security a critical aspect. Before deploying a smart contract in the system itself, programmers conduct a thorough audit of its code. This is done in order to identify potential vulnerabilities and bugs. The use of security standards such as ERC-20 (for tokens), ERC-721 (for unique tokens), and others, in turn, reduces the risk of errors and provides strong protection. The most important step to prevent various attacks and abuses is to restrict access to vulnerable smart contract functions. For example, the establishment of access keys and their provision; the transfer of access rights only to those who need it; as well as minimal access to critical functions [8].

To increase overall security, it is necessary to use only proven blockchain platforms, such as Ethereum. It is also important to use only proven programming languages, which include Solidity. The mandatory stage implies a complete and in-depth testing of the product. Due to this, various scenarios and conditions can be checked in order to detect and eliminate potential problems.

At all stages of the life cycle, a smart contract requires special attention to detail to ensure security. Development and testing, deployment and updates must be carefully thought out and implemented according to all standards. Compliance with all necessary standards and rules will help to reduce risks and ensure the reliability of the contract against various threats and attacks [9].

**Cost reduction.** The absence of intermediaries and automation significantly reduce financial costs. The need for third-party services and various related fees disappear when using a smart contract, this makes the process more economical. For example, any intermediaries or assistants, represented by banks, advocates, notaries, agents, and others, are not needed. In extreme cases, the participation of such persons is very insignificant. This, in turn, reduces various costs. The fulfillment of the terms of the contract is automated, which

reduces the need for manual processing, and process management becomes easier. All this reduces staff costs and reduces the hours needed to complete tasks. For example, traditional contracts often require a large amount of documentation and paperwork. And smart contracts have a digital format, thus reducing costs and eliminating the need for paper documentation [10].

In the field of supply and logistics, this type of contract can optimize the inventory management process, track shipments and automatically calculate payments. This reduces costs and increases efficiency.

Auto-execution of a smart contract allows you to speed up the processes of approval by the parties and regulation, which reduces time delays and increases the efficiency of business processes.

Another advantage is that the smart contract automatically makes transactions when conditions occur, which reduces the risk of fraud and errors. It can also save money that might have been lost as a result of the human factor or due to unfair actions.

In addition to the above, we note that smart contracts in blockchains often have low transaction costs, which is especially important in international financial transfers, when traditional methods may include large commissions [11].

Thus, we can say that smart contracts are very useful in business turnover by increasing accuracy, having predictability, reducing costs and improving overall productivity.

Smart contracts can provide **fast** and transparent transfers, which is especially important compared to traditional systems in the financial sector. In such systems, unlike smart contracts, transfers require time for processing and confirmation. Auto-execution of a smart contract upon the occurrence of the necessary conditions will speed up the processes and eliminate the need for manual processing. And such speed is in demand especially when it is necessary to react quickly to changes in the terms of the contract.

The smart contract works without intermediaries who are involved in the confirmation and execution of transactions, which significantly reduces the time of delays that could be due to them. Transfers and actions can be made immediately and directly between the network's counterparties. The time for coordination and regulation is also reduced, because all the terms of the contract are included in the program in advance and are executed automatically when these conditions are met [12].

Decentralized data storage in blockchains provides quick access to the necessary information without having to go through a centralized system. The blockchain network is distributed across nodes, and smart contracts are executed at the level of the entire network. This parallel execution speeds up various processes and improves overall productivity. Contract automation optimizes the business process by reducing the need for intermediate steps.

In conclusion, we can say that speed and efficiency make smart contracts especially useful in areas where time plays a key role, for example finance, supply, logistics, healthcare, etc. [13].

Smart contracts are **available** all over the world, as they work on the blockchain network. The parties to the contract may be located in different geographical locations, but this does not prevent them from making transactions. Intermediaries are not needed, as well as complex cross-border processes. The level of availability of a smart contract depends on various factors, such as: legal, technological and social. Firstly, in order to use a smart contract, each of the parties must have access to the blockchain network where these contracts were deployed. To do this, of course, there must be an Internet connection, a stable connection, and a blockchain wallet is also needed to interact with the network. Secondly, contractors should know what they are working with, how the blockchain technology works. Therefore, additional training will be required in order to familiarize the person with the principles of the contract.

The legal aspect is also very important in using a smart contract, as this will significantly affect its availability. There are quite specific laws and regulations in some countries regarding the use of blockchain and smart contracts. And in many countries of the world, there are no laws or regulations governing the legal aspects of using a smart contract. However, it is important to note that nowadays innovative technologies are developing rapidly, and blockchain technologies, being one of them, are spreading just as quickly around the world. Therefore, developed countries with a high level of blockchain technology are already regulating issues with smart contracts in the legal field.

The third aspect of the accessibility of smart contracts is the socio-economic status of the participants. Blockchain networks may charge fees for transfers and use of the platform, perhaps this will alienate a counterparty with limited finances. But still, a smart contract is much more economically profitable than traditional contracts. The absence of intermediaries, third-party services, as well as a high level of confidentiality and security are important advantages for any agreement. All these factors have a positive effect on the level of accessibility and attractiveness of smart contracts.

Experts predict that with the further development and popularization of the blockchain, smart contracts will become even more attractive and accessible [15].

**Accuracy and pragmatism.** Various errors can occur in manual processing, and automation of the process greatly reduces their likelihood. The advantage of a smart contract is that it is executed exactly according to its embedded program, while minimizing the risk of errors. Certain rules and conditions, which are prescribed in the code, are the mainstay and the main base of the smart contract. Due to this, it is precisely determined actions of which will be performed when the expected event occurs. As programs that are executed automatically, they will not be subjected to subjective interpretation, nor will they be influenced by the human factor. This contributes to accuracy and predictability.

For all counterparties of the network, the logic of a smart contract is to ensure, firstly, transparency, and secondly, the ability to verify the behavior of the contract in various situations. If the conditions programmed in the smart contract are met, then the contract will accurately and automatically perform certain actions. All this will happen without manual intervention, without the need for interpretation. Also, standards such as ERC-20 for tokens will contribute to the accuracy of the smart contract, as they are guided in their programming logic by generally accepted norms and rules.

It should be noted that despite all of the above advantages, the accuracy of a smart contract will also depend on the quality of programming, auditing their code and thorough testing. Since the accuracy of a smart contract is a matter of paramount importance, developers are required to pay special attention to this aspect during design and deployment [14].

After the smart contract is programmed in the blockchain system, the code and the contract execution history will become part of **an immutable record**. This entry guarantees that the terms of the agreement will not be changed later. Thus, a reliable and verifiable history is formed.

Immutable records in the contract are one of the key principles of the blockchain technology on which smart contracts are deployed. Blockchains are closely related to each other and contain a cryptographic fingerprint (hash) of the previous block. Thus, any change in the blocks at the same time will be reflected in the overall structure and in the cryptographic fingerprint. If any changes are needed, all parties must agree to this by consensus. However, any changes must comply with the rules of the prescribed protocol, otherwise they will be rejected. These are the principles of changes in the blockchain network, which prevents attempts to manipulate data.

Counterparties may have different levels of write rights, depending on the types of blockchains and smart contracts. For example, in a public blockchain like ETHEREUM, the record is available to everyone. However, the circle of persons who have the right to make changes is limited. There are certain rules and approvals for this procedure. A data block becomes immutable if it is confirmed by a common decision and added to the chain. That is, the records in the blockchain are made permanent in this way, they cannot be changed or deleted [16].

Such characteristics of blockchains and smart contracts make them excellent technologies for reliable and immutable records. These properties are very important in the context of money transfers, various accounts, as well as other applications in which the main factors of safe use are the integrity and immutability of data [17].

A smart contract adapts to a larger number of use cases, and this is ensured by the fact that they can be programmed taking into account various conditions and scenarios, which, in turn, contributes to the creation of complex and individual contract solutions. The architecture of the blockchain, various updates in programming languages in protocols, the contract specification itself, as well as various other factors can affect **the flexibility** of a smart contract. This is an extremely important aspect in the context of complex or multilateral agreements [18].

All of the above advantages would be excellent in **the fight against corruption**. Since smart contracts have a number of mechanisms against corruption schemes.

A registry distributed on the blockchain records and stores each transaction history and the stages of contract execution themselves. This approach makes it difficult to conceal corrupt actions, because a high degree of traceability and openness of all processes is ensured.

Since smart contracts fulfill the conditions prescribed in their code automatically, the need for trust in third parties or intermediaries is eliminated, and this can also reduce the possibility of corruption collusion. Attempts to rewrite the history of transactions or possible falsification are excluded, because the record in the blockchain is immutable. This means that, having once completed a transaction or action, counterparties cannot change, edit or delete them. All of this is stored in immutable records.

Automatic execution, dependence on code, independence from manual intervention, immutable recording — all this reduces the need for complete trust in individuals. In turn, the above has a beneficial effect on reducing the risk of corruption interference [19].

The development of a smart contract can be carried out taking into account clear rules and conditions with the key goal of preventing corruption. For example, when suspicious actions occur, special audit and automatic notification mechanisms are activated. And in the field of public procurement, such types of contracts can be used for automation and transparency of actions. This will significantly reduce the risk of various criminal schemes in decision-making in the field of public procurement. The contract can be configured with different levels of rights of the parties, which will also limit accessibility, ensuring data confidentiality. Such an approach, if executed correctly, can help to prevent corruption [20].

It goes without saying that in order to successfully fight corruption with the help of smart contracts, the developer must be interested in this. This responsible person should carefully implement effective tools for this purpose, in accordance with specific requirements and tasks.

Once again, we emphasize that smart contracts are an innovation in the field of contract execution. Despite the fact that they are still in the process of development, such contracts are already used in various sectors of life.

In general, we have familiarized ourselves with the main advantages of a smart contract. Now we propose to consider them on a specific example (Fig.) [21].

The advantage of such a contractual solution in the field of selling new homes lies in transparency and accessibility to all participants, in an automated process of payment and transfer of rights with less risks. It is also extremely important that the buyer receives notifications about each stage of construction and can see the work himself in real time [22].

The specific example below shows how a smart contract can be very useful, transparent, effective and secure for all parties to the contract.

### The stages of a smart contract for the purchase of housing in a new building

**Contract creation:** The developer creates the smart contract on the blockchain containing information about the new building, type of housing, cost, construction dates and terms of the transaction.

**Buyer Registration:** The buyer registers in the system, receives a digital identifier and connects it with the smart contract.

**Stages of construction:** The smart contract may contain construction stages with automatic payments from the buyer depending on the completion of certain construction stages.

**Payment terms:** The smart contract defines the terms of payments, for example, the amount of the initial payment, monthly construction contributions and the final payment upon completion of construction.

**Ownership rights:** The smart contract captures the ownership of a home as it is built and completed.

**Stage Notifications:** The smart contract automatically sends notifications to the buyer about the completion of each stage of construction.

**Inspection and confirmation:** The buyer can inspect the facility and confirm that the construction phase has been completed correctly.

**Automatic document signing:** A smart contract may include the ability to automatically sign the necessary documents related to the transaction as soon as all conditions are met.

**Final payment and transfer of ownership:** After completion of construction, the smart contract automatically initiates the final payment and transfers ownership rights to the buyer.

**Warranty obligations:** The smart contract may include the terms of warranty obligations provided by the developer and automatically take into account possible repairs or modifications.

Figure. The stages of a smart contract for the purchase of housing in a new building.

We propose to consider the advantages of a smart contract in the context of an urgent and problematic area for our country.

It is no secret that the judicial-executive system in Kazakhstan is extremely busy. Namely, the fulfillment of debt obligations has become long and does not in all cases give the necessary result.

The smart contract provides a number of potential advantages in the enforcement of court decisions. They automatically transfer funds when certain conditions occur. It's in their program. For example, when a debtor has a debt to a creditor, the contract, according to a predetermined logic, independently makes a payment on debt obligations.

We agree that a smart contract is potentially useful in the effective management of court decisions. The contract can make automatic calculations and accruals of court fines, compensation payments, as well as other financial calculations of various obligations. In practice, this is an extremely useful and necessary function, because traditional contracts do not have such advantages.

The smart contract code defines all the terms of the agreement according to a predetermined program, for example, the payment period, amounts and interest, fines, etc. Thus, a transparent field of the contract is provided, and the level of misunderstanding between counterparties is reduced. Recording the contract execution event in the blockchain will create an unambiguous history of all actions and changes. In turn, such records are very useful in court disputes and proceedings. Each participant can easily see the contract code and the history of its execution, which will reduce the likelihood of long and unfair litigation.

And the rapid development of technology can easily introduce information and educational tools into smart contracts that will explain all the key points of the contract in audio-video format. Since many debtors do not even read the entire text of the contract, let alone understand the meaning of what is written. People need to realize that these obligations can lead to tort.

As for the connection of a smart contract with external data (interest rates, exchange rates, etc.), then, as we previously indicated, oracles are used. They may be needed when calculating the amount of debt or interest. The automatic payment of a smart contract reduces the risk of evasion of obligations, since the payment conditions are provided in advance and are fulfilled automatically when these conditions are met. The contract settings take into account various aspects, for example, changes in rates, debt restructuring, etc. This will ensure flexible debt management.

Automation of processes related to court decisions can reduce the time and cost of executing judicial acts, since funds are automatically transferred or other actions prescribed by the decision are performed. Reducing the bureaucratic burden and speeding up the processes is very important for effective judicial enforcement.

In the case of international transactions, smart contracts can ensure the fulfillment of conditions even in the absence of trust between the parties and differences in the laws of different countries.

All these advantages, with the proper development and use of smart contracts, can get rid of unscrupulous debtors who did not think about paying the debt in advance and did not even think about "delinquencies". Also, unscrupulous microfinance organizations and banks, with unfair conditions and "frenzied" interest rates, in conditions of transparency of smart contracts, cannot deceive customers with low financial literacy, which seems to be socially important [23].

Despite the many advantages, it is worth noting that the use of smart contracts in the judicial sphere also involves a number of challenges. For example, issues of legal liability in case of errors in the code, as well as the need to take into account the specifics of specific court decisions, etc. The integration of smart contract technology with the traditional justice system requires appropriate changes in legislation and procedures. And this implies a long and responsible process that requires careful research and development.

In Kazakhstan, the issue of the legal status of smart contracts is under consideration, and at the moment there is no clear definition of these contracts at the legislative level. Despite the fact that the Civil Code of the Republic of Kazakhstan does not provide a direct legal status to smart contracts, it also does not prohibit their use or the use of other types of digital contracts.

It is already possible to detect the use of smart contracts in various spheres of life in Kazakhstan. For example, in 2021, the Central Bank of Kazakhstan issued a license to a local bank to manage trade finance, which is based on a blockchain system and uses smart contracts. Commerzbank, together with BASF and Evonik, has also launched a new project starting in 2021. The mentioned project uses smart contracts to conduct transactions for the payment of goods and services from suppliers. This platform is based on blockchain and performs operations using a decentralized system [24].

### *Discussion*

The legal nature of a smart contract is determined by legal scholars in the following ways:

Experts from The Chamber of Digital Commerce conducted an analysis of the design of smart contracts from the point of view of the legislation of the United States and Spain, relating respectively to the Anglo-Saxon and continental legal systems. As a result of the research, the similarity of the elements of contracts in both legal systems was found, despite the difference in terminology.

It is proposed to consider smart contracts not as a new type of contract, but as a new way of fulfilling obligations, namely, automated execution. This underlines the importance of searching for legal instruments that allow to determine the automated fulfillment of obligations and clarify the role of the party obligated to fulfill the contract [25].

Given the functional purpose of smart contracts, it is important to clarify the essence of automated performance of obligations in the context of contractual law, as well as to study the role of the debtor in such performance.

Chinese scientists, S. Lin, L. Zhang, L. Li, G. Ji, Y. Sun consider a smart contract to be a contract presented in the form of a program code on the blockchain platform, which, under certain circumstances, ensures autonomy and self-fulfillment of the condition [26]. However, please note that this definition does not comply with the norms of the Civil Code of the Republic of Kazakhstan, where it says that a contract is an agreement on the establishment, modification or termination of civil rights and obligations. The transaction is concluded orally or in written (electronic) form. That is, the program code cannot convey the terms of the transaction to which the parties agreed [27].

Russian scientists L.G. Efimova and O.B. Sizemova present smart contracts as a new method of ensuring the fulfillment of obligations based on automatic execution, which, in their opinion, contributes to the establishment of trust between the parties. They claim that the enforcement of obligations in the case of smart contracts is carried out programmatically using the appropriate protocols of the blockchain platform.

Nevertheless, the same authors, namely L.G. Efimova and S.B. Sizemova, define smart contracts as an independent contractual structure that occupies a special place among the non-independent contracts described in the first part of the Civil Code of the Russian Federation. These contracts reflect the specifics of the conclusion or the specific legal consequences of any civil law agreement, if it meets the criteria established by law [28].

Other authors also support this point of view, pointing out that according to Article 309 of the Civil Code of the Russian Federation, a smart contract can be defined as a standard (special) contractual structure. Such a contract is concluded using electronic or other technical means, and its terms provide for the fulfillment of obligations arising, under certain circumstances, without a separate expression of the will of the parties, through the use of information technologies defined by the terms of the contract [29].

A.I. Saveliev considers a smart contract as a form of contract, describing it as a program code on the blockchain platform that provides autonomous and self-fulfilling implementation of the terms of the contract upon the occurrence of predetermined circumstances. According to A.I. Savelyev, smart contracts eliminate the need for subsequent execution and disposal of the parties, since the program automatically fulfills all the terms of the contract. This may lead to the disappearance of the concept of "obligation" in the traditional sense [30].

L.G. Efimova and O.B. Sizemova point out the unique features of smart contracts (form in the form of computer code, conclusion using blockchain technology, subject of execution), including a digital financial asset and automatic execution upon the occurrence of certain conditions, provided by software.

A.A. Volos defines a smart contract as a programmed contract, the terms of which are written in the code and which is automatically executed using the blockchain [31].

The introduction of smart contracts raises questions in private international law, since existing international conventions, such as the Vienna Convention on Contracts for the International Sale of Goods, do not provide for scenarios using smart contracts. The need to develop unified standards for regulating smart contracts in cross-border trade remains relevant [32].

Kazakh scientist M.K. Suleimenov speaks about the legal nature of a smart contract as follows. In his opinion, "a smart contract is not just a program code, but a legal fact that generates various legal relations, including proprietary, binding and exclusive rights. Unlike traditional ways of ensuring the fulfillment of obligations, a smart contract is not just a mechanism for ensuring fulfillment, but is an independent contract, the execution of which is automatically carried out upon the occurrence of certain conditions.

The peculiarity of a smart contract is its method of execution, namely that it is automatic, using the principle of “if... then”. Thus, it does not fit into the traditional classification of contracts, but can form the basis of a wide variety of agreements, including purchase and sale, exchange, lease and others.

From a legal point of view, a smart contract can be considered as a written transaction carried out using electronic or other technical means that ensure the safety of the contents of the transaction on a tangible medium. The signature in this context can be executed in any way that allows identifying the person who expressed his will, in accordance with the requirements of the law or the agreements of the parties.

A smart contract, along with the fact that it is a program code, is a legal fact that generates legal relations (proprietary, binding, exclusive)” [33].

Thus, the opinions of the authors differ, and the legal nature of smart contracts has not yet been clearly defined.

We agree with the opinion of the author M.K. Suleimenov, which we quoted above, that it is not necessary to divide the concept of a smart contract into two parts smart contract and legal smart contract. This is the same contract with two sides: technical and legal. Both sides complement each other, are in close interaction and interdependence. The very concept of a “smart contract” is in the legal field with the technical base and foundation of IT.

Summarizing the opinions of scientists regarding the legal nature of smart contracts, we come to the following conclusion:

1) The legal essence of a smart contract is based on its program code, which can be adapted to the specific circumstances and needs of the participants in the transaction. This code takes into account algorithms related to the execution of agreements and procedures for concluding contracts in electronic form.

2) Currently, there is no legally fixed definition of the term “smart contract” in the Civil Code of the Republic of Kazakhstan. For example, there is such a definition in the legislation of the Russian Federation. In accordance with the new addition to Article 309 of the Civil Code of the Russian Federation, the terms of the contract may establish provisions according to which the obligations of the parties arising from the transaction are fulfilled automatically upon the occurrence of certain conditions, without the need for additional expression of will by the parties, through the use of information technologies provided for in the terms of the contract. In our opinion, this provision can be included in the Civil Code of the Republic of Kazakhstan as paragraph 2 of Article 272 of the Civil Code (Proper performance of obligations), as suggested by our scientists.

3) In the legal literature and the press, there has been an increase in the use of smart contracts in various areas of public relations. However, it should be borne in mind that at the moment they are still not a widespread tool for ordinary consumers and entrepreneurs. The inclusion of smart contracts in household, medium and large transactions continues to be a relatively minor phenomenon, and this tool is still new and unusual for most people, in particular for the CIS countries.

### *Conclusions*

Thus, our research allows us to formulate the following conclusions.

A smart contract is a programmable digital contract that implies conditions that are fulfilled automatically using blockchain technology. Based on the analysis of various sources and materials, such a short definition can be made.

Smart contracts offer a number of advantages in various industries due to their automated, secure and decentralized nature. We have identified 10 main advantages of a smart contract: automation, transparency, security, cost reduction, speed, accuracy, accessibility, immutable record, flexibility and anti-corruption schemes.

The developed theoretical model of a smart contract for a transaction for the purchase of housing in a new building showed us the effectiveness of this type of agreement on a specific example.

To date, the use of smart contracts in debt obligations could significantly relieve enforcement proceedings due to its effective use of the advantages of a smart contract.

Based on the analysis of domestic legislation, it can be argued that in the Republic of Kazakhstan, the legal status of smart contracts has not yet been defined in the legislation. There are indirect rules providing for smart contracts, but we would like to note that there are no separate legal norms directly establishing the procedure for the application of smart contracts.

Nevertheless, world practice demonstrates the successful use of smart contracts in various spheres of life. And we must use smart contracts wisely for the benefit of society. The need to develop legal norms regulating the legal mechanism for the application of smart contracts is relevant right now.

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С.С. Боранбай, Э. Юхневичус

## Смарт келісім-шарт тұжырымдамасы: артықшылықтары және Қазақстан Республикасында құқықтық реттелуінің қазіргі жағдайы

Мақалада өмірдің әртүрлі салаларында смарт келісім-шарт тәріздес шарттардың кең таралуына қарай өзектілігі арта түсетін болғандықтан олардың құқықтық реттелуінің қазіргі жағдайы қарастырылған. Мәселен, смарт келісім-шартты пайдалану кезіндегі қатынастарды реттеудің басты проблемасы оның құқықтық мәнінің анықталмауында, заңнамада, атап айтқанда, Қазақстан Республикасының Азаматтық кодексінде реттелмеуінде болып отыр. Сонымен қатар, шарттарды жасасу, өзгерту, тоқтату және орындау процесін жеңілдетуге көмектесетін смарт келісім-шарттың кейбір артықшылықтары мысалдармен айқын көрсетілген. Сондай-ақ автоматтандыру, ашықтық, қауіпсіздік, тиімділік, делдалдарға төмен шығындар, орталықсыздандыру, икемділік және бағдарламалану сияқты смарт келісім-шарттардың негізгі артықшылықтары егжей-тегжейлі сипатталған. Зерттеу барысында борышкерлік міндеттемелерді орындаудың мәселелері қарастырылып, атқарушылық іс жүргізудегі смарт келісім-шарттың әлеуеті мен пайдалы жақтары сараланды. Зерттеудің нәтижесі смарт келісім-шарттың тұжырымдалған анықтамасы мен дәстүрлі емес шарттардың бұндай түрінің нақты артықшылықтарының айқындалуы. Мақаланы қорытындылай келе авторлар ҚР заңнамасында смарт келісім-шарттың заңды анықтамасының жоқтығын; оны құқықтық реттеудің тек декларативтік сипатта екендігін; бұндай нысандағы шарттарды қолдануға болатын құқықтық қатынастар аясының анықсыздығын ерекше атап өткен. Бұндай факторлардың смарт келісім-шарттарға кең таралып, қолдануға кедергі болып отырғанына назар аударған.

*Кілт сөздер:* блокчейн, смарт келісім-шарт, цифрландыру, инновациялық технологиялар, автоматтандыру, ақпараттық технологиялар, электрондық сауда, Ethereum, Solidity, криптография.

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## Концепция смарт-контракта: преимущества и нынешнее положение правового регулирования в Республике Казахстан

В статье обозначены нынешние положения правового регулирования смарт-контрактов, актуальность которых будет расти по мере распространения подобных договоров в различных сферах и областях жизнедеятельности. Так, главной проблемой регулирования отношений по использованию смарт-контракта становятся неясность его юридической сущности, отсутствие регламентации в законодательстве, в частности в ГК РК. Вместе с тем наглядно показаны на примерах некоторые преимущества

смарт-контракта, которые помогут облегчить процесс заключения, изменения, прекращения и исполнения договоров. Подробно рассмотрены основные преимущества смарт-контракта, такие как автоматизация, прозрачность, безопасность, эффективность, низкие затраты на посредников, децентрализация, гибкость и программируемость. Конкретно были затронуты в исследовании проблемы исполнения обязательств в долговых отношениях, потенциальные преимущества и помощь смарт-контракта в исполнительном производстве. Результатом исследования является сформулированное определение смарт-контракта и выявление конкретных потенциальных преимуществ данного вида нетрадиционных договоров. Авторы подводят итоги, отмечая факт отсутствия легального определения смарт-контракта в законодательстве РК, исключительно декларативный характер его правового регулирования; неясность круга общественных отношений, где применимы договоры в подобной форме, что не дает возможности широкого распространения и использования смарт-контракта.

*Ключевые слова:* блокчейн, смарт-контракты, цифровизация, инновационные технологии, автоматизация, информационные технологии, электронная торговля, *Ethereum*, *Solidity*, криптография.

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