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Digitalization of civil law relations in Kyrgyzstan

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Abstract
The article examines the legal aspects of the digitalization of civil law relations in Kyrgyzstan, focusing on the use of blockchain technology and smart contracts. The advantages of these technologies are explored, including transparency, security, and the automation of legal processes. Issues related to regulatory limitations, such as the legal uncertainty of smart contracts and data protection concerns, are analyzed. The challenges of integrating blockchain and smart contracts into the country's legal system, including the need to adapt the legislative framework and overcome institutional barriers, are also discussed. Particular attention is paid to the prospects for implementing these technologies in areas such as property rights registration, contract automation, and the modernization of public registries.

Keywords: Digitalization, civil law relations, blockchain, smart contracts, legal regulation, Kyrgyzstan.

Introduction

The rapid development of digital technologies significantly changes approaches to the organization of different. Most countries are trying to actively implement digital tools in areas like government administration, business, and citizen service, which allows for preconditions to a more transparent, accessible, and effective conduct of these processes.

The most promising direction of digitalization is the use of blockchain technology and smart contracts in civil law relations. Their application opens completely new horizons for improving the efficiency of legal processes and minimizing the human factor in fulfilling contractual obligations. However, embedding these technologies into the legal sphere faces a number of legal challenges. The aim of this study is to analyze the legal aspects of introducing blockchain and smart contracts into civil law relations in Kyrgyzstan.

Main Part. Theoretical and Legal Aspects of Using Blockchain and Smart Contracts

Digitalization of civil law relations implies the implementation of advanced technologies, among which a great role is played by blockchain and smart contracts. These tools have huge potential for changing legal regulation and the organization of contractual obligations, offering opportunities to enhance transparency, security, and the automation of legal procedures.

Blockchain is a distributed ledger technology that is decentralized in nature. It organizes transactional records into a chain of blocks and protects them with various cryptographic methods. One of the important features of the blockchain is its immutability: information once entered into the registry cannot be changed or erased, which provides a high degree of protection against fraud and falsification. Decentralization through blockchain removes the central authority and therefore reduces the potential for abuse and technical failure. The blockchain is an enabler for the implementation of smart contracts, a set of programmatic algorithms that automatically enact the terms of a contract once its conditions are met (fig. 1).

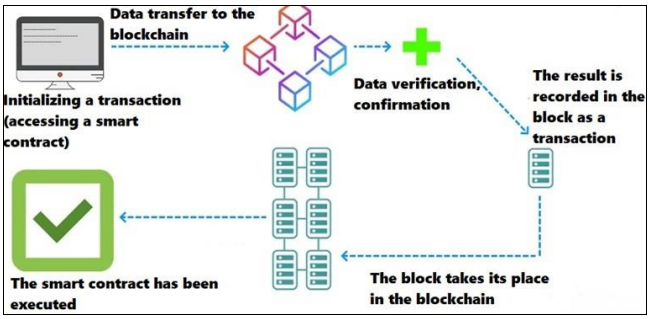

Fig 1. Principle of blockchain and smart contract operation [1]

The advantages of blockchain and smart contracts in civil law relations are evident in three aspects: security, transparency, and automation. Security is achieved through cryptographic data protection and the distributed nature of information storage. This eliminates the possibility of record tampering, making blockchain a reliable tool for use in areas requiring a high level of trust, such as property rights registration or notarial actions. Transparency is ensured by the fact that all transactions recorded on the blockchain are available for verification by network participants, increasing trust between parties in civil law relations. Automation, mediated by smart contracts, removes the intermediaries from the equation in the satisfaction of obligations and reduces the costs of a transaction significantly [2].

The integration of blockchain and smart contracts into civil-law relations in Kyrgyzstan has the potential to improve the effectiveness and reliability of legal processes greatly. At the same time, widespread application requires the development of a regulatory framework that recognizes them as legally relevant tools.

Legal aspects of blockchain and smart contract implementation in Kyrgyzstan

Digitalization of legal processes requires updating the legislative framework so that it will be able to respond to modern challenges and provide a legal basis for the application of innovative technologies. In Kyrgyzstan, the development of a regulatory framework for digital technologies is still in its formative stages, since the existing

elements do not address important aspects of advanced tools like blockchain and smart contracts. Despite the implementation of programs like «Taza Koom» and «Sanarip Kyrgyzstan», aimed at accelerating digitalization, the legislation remains focused on basic mechanisms such as electronic document management and digital signatures [3]. Automation, distributed ledgers, and other complex technologies are relatively absent in legal domains for broader application.

For instance, the Law on Electronic Signatures provides for the legal validity of a document signed in digital form but does not consider all the peculiarities that come with a smart contract since it operates according to programmatic code [4]. This creates a situation where such automated agreements fall outside the scope of official legal recognition, complicating their application in civil relations. Moreover, blockchain is used exclusively at the level of private initiatives, as there is no legal regulation enabling its integration into government registries or notarial procedures. Legislation on intelligent systems in general has yet to be developed, despite their potential to improve the efficiency of legal processes.

The issue of legal recognition of smart contracts is particularly acute in civil law. The Civil Code of Kyrgyzstan is oriented toward traditional forms of contract conclusion, such as written or verbal agreements, as well as notarized transactions. Automatic performance of smart contracts does not fit these frameworks, raising legal uncertainty about their applicability [5].

Thus, the current legal framework does not take into account the peculiarities of modern digital technologies and even creates obstacles for adapting them to the country's legal system. To understand what issues are most relevant to solve in the process of integrating blockchain and smart contracts into the legal sphere, it is necessary to systematize the main challenges and related problems (table 1).

Table 1. Legal issues related to the implementation of blockchain and smart contrast [6, 7]

Category of legal issues	Description of the problem	Consequences and challenges
The legal force of smart contracts	Smart contracts do not have official recognition in the current civil legislation of Kyrgyzstan.	The uncertainty of the legal status leads to difficulties in their use and enforcement.
Responsibility for mistakes	There are no rules governing the liability of the parties for failures or errors in the software code of the smart contract.	Conflicts between the parties remain unresolved, especially if automation leads to unintended actions.
Regulation of blockchain transactions	Blockchain technology assumes the irreversibility of transactions and the absence of a central authority.	Difficulties in canceling, changing or canceling transactions using traditional court procedures.
Data protection	In the blockchain, information is unchangeable and accessible to all network participants, which contradicts the laws on personal data protection.	Risks of leakage of confidential information and violation of the right to delete data.
Jurisdictional issues	Blockchain is often used in a transnational environment, which complicates the definition of applicable legislation.	Problems of coordination of national and international regulation, as well as difficulties in dispute resolution.
Recognition of evidence	There is no clear legal status of blockchain records as evidence in litigation.	Participants are deprived of the opportunity to use data from the blockchain as reliable evidence in court proceedings.

In the opinion of the author, significant legal barriers prevent the complete integration of blockchain and smart contracts into Kyrgyzstan's legal system. Despite having a huge potential for automation and providing more transparency of legal processes, their application remains uncertain, thus slowing their development and nurturing distrust among participants in civil transactions. Without regulation, using blockchain and smart contracts involves considerable risks, which cannot be handled under the current status quo of regulation.

Therefore, there is a pressing need to develop specialized legislation that will provide legal recognition of these technologies, adapt existing norms to their specific features, and minimize risks associated with their use. Such regulation would be a vital step toward creating a modern legal environment capable of supporting the digitalization of civil law relations and stimulating economic development.

The potential of blockchain and smart contracts in civil law

In the context of the rapid advancement of digital technologies, blockchain and smart contracts are emerging as tools that not only modernize legal processes but also redefine the nature of civil law relations. For Kyrgyzstan, which is undergoing digital transformation, these technologies offer unique opportunities to improve the transparency, reliability, and automation of various legal procedures. This is particularly important for enhancing trust in state institutions and reducing costs in private relations.

One area of blockchain and smart contract application is the automation of contractual relations. Such technologies can considerably simplify and secure various transactions: lease agreements, sales contracts, or insurance policies. Smart contracts, as autonomous programs, ensure the automatic execution of obligations, excluding any need for intermediaries and reducing the risk of human error. For example, it might be programmed in lease agreements to automatically deduct the rent from the tenant's account at a specific date, while breaching the contract can get the lease rights automatically terminated. Correspondingly, in insurance cases, smart contracts might afford immediate payouts upon events arising.

Successful international practices confirm the effectiveness of using blockchain and smart contracts in civil-law relations. For example, the state of Vermont in the USA integrated blockchain into property registries, recording changes in property ownership [8]. Such a system completely eliminates the possibility of document falsification, increases the transparency of transactions, and reduces verification costs.

For example, AXA developed the «Fizzy» insurance product based on smart contracts to automate compensation payments in cases of flight delays. This solution shows how

the automation of processes can minimize time costs and improve the quality of services provided [9].

This provides a new opportunity for blockchain technology application to modernize the public registries. An insufficiency of transparency and security in data concerning property rights, notarial processes, and cases of inheritance-the problems challenging Kyrgyzstan's legal system-may be avoided with a blockchain due to its complete immutability and a decentralized nature. For example, blockchain-based property rights registries avoid any kind of forgery or unauthorized modification to the information about owners and encumbrances. It is very relevant in order to prevent fraudulent schemes in the real estate sector, where human factors and document manipulation remain significant risks. In notarial practice, blockchain can be used to store notarized documents and automatically verify their authenticity, removing the need for a notary's physical presence at every stage of the transaction. In addition, in inheritance cases, blockchain can record and automatically execute wills, making the process of inheritance simpler and minimizing the chances of disputes among heirs.

Another prospective direction is the application of smart contracts for alternative dispute resolution. Modern means of conflict resolution in the civil-law sphere are often associated with prolonged court proceedings and high costs. Smart contracts can automate the execution of decisions reached through mediation or arbitration, thereby considerably accelerating the performance of obligations. For instance, a smart contract in a commercial dispute can be programmed to automatically transfer funds to the account of an aggrieved party upon determination by an arbitrator of the compensation due, without any further action in enforcement. This approach not only reduces the time required for dispute resolution but also enhances the trust of the parties in the process through the transparency and immutability of blockchain data.

Thus, the potential of blockchain and smart contracts in Kyrgyzstan’s civil law sphere lies in creating a more transparent, efficient, and secure legal environment. These technologies can not only modernize traditional processes but also address systemic issues, including insufficient registry protection, high transaction costs in contractual relations, and the complexity of dispute resolution.

Conclusion

Digitalization of civil law relations, including blockchain and smart contracts, testifies to one more step towards the building of a modern legal system which could meet the challenges of a digital era. This technology is allowing unique opportunities for automating legal processes, making it more transparent and diminishing the human factor-a very relevant demand in the context of rapidly transforming governance and business. However, this all depends directly on whether the legal system is ready to be renovated according to new realities.

Overcoming the existing barriers includes, first of all, the development of a regulatory framework for the use of blockchain and smart contracts in civil-law relations, which has to be provided with the definition of the legal validity of a digital contract, responsibility for failures, data protection, integration into public registers, and mechanisms of dispute settlement. These measures will not only expedite the use of advanced technologies but also strengthen citizens' and businesses' confidence in the legal system, which will promote economic development and modernize society. Thus, digitalization of civil law relations in Kyrgyzstan can become an important factor of sustainable development in the era of digital transformation.

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