

Smart contracts in international trade in services in the field of intellectual property

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Abstract — The paper studies how to use a smart contract, including for the coordination and fulfillment of international contractual obligations for trade in services in the field of intellectual property. Attention is drawn to the special nature of smart contracts as self-enforceability and self-sustainability. As a result, their use for commercial purposes provides the contract parties with significant advantages, such as: reduction of costs for maintenance and enforcement, reduces the number of persons involved in the implementation of the obligation, diminishes the volume of documents under the contract, and eliminates bureaucracy. When developing smart contracts, a number of conditions should be taken into account: the actual semantics of the platform on which the contract will be placed; writing a secure smart contract code before placing a contract on the network, since it is the smart contract code that identifies its vulnerabilities. It is noted that the problem of interaction between lawyers and developers of the contract program code can be solved by using the code to formulate, verify, and enforce the agreement between the parties.

In cross-border trade in services in the field of intellectual property, a smart contract can solve a number of important tasks: reduce the time for execution of the contract by the parties, ensure the protection of intellectual property, and reduce the costs of enforcement.

Keywords — smart contract, blockchain, international trade in services, intellectual property, license agreement, patent, trademark.

I. INTRODUCTION

The growth of cross-border trade in services in the field of intellectual property amid a decrease in cross-border trade in goods necessitates the improvement of the legal support of transactions for the provision of these services. An important question is: in what form should the agreements on international trade in services be completed? The simpler and more accessible the contract form will be, the more actively subjects of foreign economic activity will be involved in the export of services. It should also be borne in mind that intellectual property services also require special protection methods.

In cross-border trade in services, the contract parties, as a rule, have various kinds of obstacles in its implementation. Firstly, when providing services, exporters and their foreign customers have significant risks, and therefore the parties are forced to incur significant costs for the preparation and implementation of contracts. Secondly, the cross-border

movement of services is associated with a large amount of written documentation, starting with the international contract itself and ending with all kinds of accompanying documents (including payment documents). Thirdly, significant labor costs in the implementation of international trade in services. Fourth, the complexity and riskiness of cross-border payments, which are made by several banks, such as the bank of the sender, the bank of the recipient, and the correspondent bank.

We believe that a smart contract based on the blockchain allows eliminating the above disadvantages. The blockchain is a universal tool for creating secure, decentralized, peer-to-peer applications. Blockchains are used to create stand-alone computer programs called smart contracts to speed up payments, to create financial instruments, to organize the exchange of data and information, as well as to facilitate the interaction between people and machines [1]. Smart contracts are effective rights management tools that ensure coordination and enforcement of agreements between network participants without using traditional legal contracts. With the help of smart contracts, it is possible to formalize the relationship between people with institutions and assets that they own through the Internet completely without the need for trusted intermediaries [2].

Smart contracts, unlike classical legal contracts, have the property of self-sustainability. The technical description of this property can be represented as follows: it is a self-sustaining agreement built into computer code managed by the blockchain. Moreover, the agreement contains a set of rules, according to which the smart contract parties agree to interact with each other. The agreement is automatically applied in cases where the parties comply with predefined rules. In this meaning, the smart contract acts as a cryptographic box that opens the value or access, subject to the fulfillment of certain specific rules. The blockchain stores data and access rights, protects them from deletion, falsification, and revision. As a result, smart contracts are a publicly accessible, verifiable way to implement management rules and business logic in several lines of code [3].

II. SMART CONTRACTS AND WAYS OF THEIR USE

A smart contract, when used correctly, can provide transaction security that is many times superior to the classic

contractual design. At the same time, the costs of maintaining and enforcing smart contracts are significantly reduced. This is achieved by the ability of smart contracts to monitor the execution of the agreement between the parties online, where compliance with the requirements of the agreement and control over the execution are carried out simultaneously, in a split second. Thus, the use of smart contracts is economically beneficial in connection with a significant reduction in costs at all stages of the agreement: conclusion of the agreement; fulfillment of conditions by the parties, and its enforcement. There is no need to appeal to contractual agents and other intermediaries, which, in turn, guarantees transparency and accountability, reducing red tape.

A smart contract should be distinguished from a legal contract. So, the effectiveness of a smart contract directly depends on the qualifications of the people who encode it and take into account all the necessary information at the time of encoding. In order for smart contracts to use their full potential to enforce the legal contracts subject to certain conditions, it is necessary to resolve technical and legal problems by coordinating the actions of lawyers and software developers [4].

Smart contract security also requires technical authorization. It should be noted that the security in the work of smart contracts is due to such reasons, as: a) smart contracts work with financial assets; b) the mistakes made in them cannot be corrected because of the peculiarity of the blockchain; c) changes in the blockchain arising from transactions of fraudulent contracts cannot be rolled back (restored until the moment of change). Smart contract vulnerability issues are related to the technical features of these agreements. First, smart contracts, unlike regular programming, do not allow exception handling. So, if the exceptions normally generated in the program can be caught, processed, and the program continues to work, then exceptions cannot be caught and processed in smart contracts, and attackers can take advantage of this in their attacks. Secondly, using one smart contract, it is possible to call the functions of another smart contract in different ways, which in turn allows attackers to re-enter the functions.

In order to prevent encroachments on the security of smart contracts, experts suggest, first of all, that smart contract developers take into account the real semantics of the platform on which the contract will be placed. N. Atzei, M. Bartoletti, and T. Cimoli write more about vulnerabilities in smart contracts, dividing vulnerabilities into three levels: Solidity language level, EVM level, and blockchain level [5]. In this paper, we note the importance of writing a secure smart contract code before placing a contract on the network, since it is the smart contract code that identifies its vulnerabilities.

III. SMART CONTRACT AND ITS LEGAL REGULATION

The widespread use of smart contracts both at the national and international levels is hampered by the absence of a well-formed legal regulation. We believe that the reasons for the legal vacuum in this area include: the State's willingness to

legislate a smart contract; the existence of different points of view in the legal doctrine on the nature of a smart contract; interaction of lawyers and developers of the contract program code.

We turn to the problem of legislative consolidation of a smart contract. Currently, most countries decide to amend the current legislation regarding the regulation of the blockchain and smart contracts based on it. In the future, this circumstance will require the development of international agreements on the use of smart contracts for the cross-border movement of goods, works, and services. However, not all countries have an univocal approach to regulating smart contracts. This is connected with the second problem: the different points of view in the legal doctrine on the nature of a smart contract [6].

According to the first point of view, a smart contract is a legal contract concluded in electronic form, while the fulfillment of this contractual obligation is automated and it is provided by a computer program. Supporters of the second point of view define a smart contract as a computer program or code programmed for certain tasks in case of fulfillment of predetermined conditions. At the same time, a smart contract in the form of a stand-alone computer program can be placed on a specific address in the blockchain, restarted many times, and programmed for various needs of the business community.

In our opinion, the most effective model of smart legal contracts in contractual regulation is a combination of a smart contract code and a traditional legal obligation using legal terminology [7]. For example, imagine that a service contractor enters into a smart legal contract with a foreign customer. Terms of payment can be defined in the code and executed automatically when the service is provided. However, the customer is likely to insist that the contract includes a reimbursement clause, according to which the contractor will reimburse the customer for losses from claims related to improper performance of the service. It is quite clear that this condition is not required to be indicated in the code, since it is not self-enforceable, but for a smart legal contract, it is necessary for the purpose of possible further enforcement in an arbitration dispute.

The problem of interaction between lawyers and developers of the contract program code can be solved by using the code to formulate, verify, and enforce the agreement between the parties.

IV. METHODS AND MATERIALS

The methodological basis of this paper is the dialectical method of understanding the reality in its connection and interaction. During the preparation of the study, general scientific and special methods of science, such as the analysis of theoretical sources and regulatory sources, comparative legal, system-structural, and logical, have been used. The application of these methods allowed the authors to analyze the subject of study in the interconnectedness and

interdependence of its constituent elements, their integrity, comprehensiveness, and objectivity.

As research materials, theoretical sources, normative legal acts, and statistics of the World Intellectual Property Organization have been used.

V. RESULTS

A. *Smart legal contracts and international trade in services in the field of intellectual property*

We believe that in order to use a smart contract in international trade in services in the field of intellectual property, it becomes necessary to determine the nature and purpose of such a contract, to develop the terminology of the contract, to define the features of the subject of such an obligation, as well as the procedure for securing intellectual property rights taking into account the principle of territoriality of protection for results of intellectual activity. The export of intellectual property services is currently regulated at two legal levels: international and national. The institutional framework for international trade in services was formulated by the World Trade Organization (hereinafter referred to as the “WTO”) in the General Agreement on Trade in Services (hereinafter referred to as the “GATS”) (WTO, the Uruguay Round of Multilateral Trade Negotiations, April 15, 1994). This agreement is binding on all WTO members, including Russia.

The GATS regulates international trade in services both between residents of different countries—members of the WTO and domestic trade in services by residents and non-residents within the borders of the national territory. The GATS presents several models for the provision of services, such as: 1. cross-border provision of services; 2. consumption abroad; 3. commercial presence; 4. the presence of an individual.

In the cross-border provision of services, the contractor provides the service in the territory of a member country from the territory of another member country. When consumed abroad, the service is provided outside the territory of the member country of the service contractor to the recipient of the service in the territory of its member country. Service delivery with the commercial presence of the supplier is carried out in the territory of a member country. Service delivery in the presence of a contractor in the form of an individual is carried out in the territory of a member country.

Note that at present, in addition to the above methods of delivery of services, one can distinguish another method when services are delivered simultaneously with goods. It should be borne in mind that the majority of services consumed by non-residents in the country where the service contractor is located, as a result, the internal institutional environment is important when exporting services in this way.

In the future, there will be changes in the services sector related to digitization and the use of digital online platforms in connection with which the export of services is transformed

into new forms of trade in services in a virtual environment. Thus, the volume of consumption of services will significantly decrease during the cross-border movement of individuals, both for the provision of services and for receiving them due to new technologies of telepresence, virtual and augmented realities, and remotely controlled robotics.

The tendency of international delivery of services through the information and communication network “Internet”, as well as remote provision of services, is increasing.

According to international statistics, the volume of registration of intellectual property is increasing.

Thus, according to the annual report of the World Intellectual Property Organization (hereinafter referred to as the “WIPO”) “World Intellectual Property Performance Indicators” (WIPI), in 2018, 3.3 million patent applications were filed, for which it is noted that the number of patent applications has continued to grow for the ninth consecutive year, which has already reached 5.2%. During the reporting period, the number of filed applications for trademarks increased to 14.3 million and industrial designs—up to 1.3 million. Separately, the report noted an increase in the number of applications for patents, trademarks, and other intellectual property by residents of Asian countries, mainly China and India. Thus, China accounts for almost half of all filed patent applications in the world [8].

Along with this, the export of services in the field of intellectual property is increasing, which is aimed at the transfer by the service contractor of intellectual rights to patent property and trademarks, to objects of copyright and related rights, etc. Thus, the United States and European countries account for 80 percent of all global exports of intellectual property services.

As a result of this growth, it becomes necessary to propose the widespread use of smart legal contracts in the international trade of services in the field of intellectual activity [9].

B. *The structure of the international smart contract of the intellectual property item license agreement*

We offer the following structure of a smart contract in this area.

Subject of the smart contract of the license agreement for the result of intellectual activity (for example, an invention) or for an individualization tool (trademark): the licensor (service exporter) transfers or undertakes to transfer the right to use the invention (trademark), and the licensee agrees to pay the license fee.

The rights and obligations of the parties to the license agreement: the licensor is obliged to transfer the registered right to use an invention (trademark), protected by a patent (certificate).

The licensee undertakes to use the invention (trademark) in the ways established by the license agreement. The licensee

shall pay the license fee in the manner and in the amount established by the agreement.

The contract is subject to registration in the prescribed manner and comes into force from the date of registration.

The law to be applied: the right of the licensor (licensee), or the law of the country in which the invention (trademark) will be used, or the right of the court chosen by the parties, or the rights of a third country, the provisions of which on the licensing agreement are most acceptable to the parties [10].

Smart contracts for international trade in services in the field of intellectual property: barriers to use and ways to overcome them.

Currently, in the international trade in services in intellectual property, there are a number of obstacles to the widespread use of both classic legal contracts and smart legal contracts. These include: a sufficiently long period for registering patents and trademarks, high patent fees, the complexity of judicial protection of violated rights, the growth of counterfeit and pirated products, the absence or insufficiency of information and legal support for the contract parties.

In order to overcome these problems, it is necessary to take measures at the international and national level to strengthen criminal and administrative liability for violation of the rights to the results of intellectual activity, to establish longer patent validity periods, and to create restrictions on the forced transfer of technologies.

It is also required to simplify the procedures for the registration of rights to intellectual property results by countries in order to increase the export of these services by residents, to take measures to reimburse the costs of patenting abroad.

VI. DISCUSSION

In the framework of this study, the authors have studied the features of the nature of smart contracts, which are based on self-sustainability and self-enforceability. In order to fully study the use of smart contracts as the legal contracts, an analysis of the works of foreign and domestic researchers on the technical and legal problems of smart contracts has been carried out. The volume of the study does not allow to fully

disclosing all related issues on the use of smart contracts in international trade in services in the field of intellectual property. The authors will continue research in this area and consider the possibility of making proposals on the international regulation of the use of smart legal contracts in trade in services in the field of intellectual property.

We believe that the results of this study can be used for further research on the problems of using smart contracts in international trade in services.

VII. CONCLUSION

We believe that the goal was achieved during the study, namely: the nature of smart contracts has been revealed, the possibility of using smart contracts for international trade in intellectual property services has been identified, and ways to overcome problems for the widespread use of smart contracts have been proposed. The data obtained can be used by lawyers in international contract practice to solve the problems of the technical and the legal nature of a smart contract.

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