

Smart Contracts: New Boundaries Between the Law and the Internet

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The present study analyzes Smart Contracts and Blockchain technologies from the perspective of Contracts Right. Thus, seeks to investigate the general theory of contracts to identify whether smart contracts inserted in a blockchain meet the requirements of validity, existence, and efficiency. In addition, it seeks to use the figure of the Judge as a Service in arbitration and Ricardian Contracts to work the dynamics between traditional law and new technologies. The deductive method and scientific research were used, having as theoretical references the Brazilian Civil Code and the article, “Blockchain smart contracts and Judge as a service in Brazilian legislation.”

Keywords: smart contracts, blockchain, judges as a service, Ricardian contracts, arbitrage

INTRODUCTION

The advancement of times and technologies have profoundly modified the way in which people interact and, consequently, the contract models need to evolve to keep up with the new times. The UNCITRAL Model Law on Electronic Commerce, back in 1996, institutionalized electronic contracts, establishing legal and social guidelines for the use of digital means of communication (UNO, 1996). Afterward, digital contracts evolved over the years, resulting in Smart Contracts, which had their applications increased with the development of blockchain technology, created in 1996, by the American computer scientist and cryptographer Nick Szabo.

Due to the technical complexity involving such innovations, the researcher sought, through bibliographic and documentary research, to present an introduction to the theme, explaining the concept and operation of blockchain technology, with a focus on Smart Contracts.

The topic reflects a new context within the Brazilian Judiciary, especially if one considers the Economic Freedom Law (Law 13.874/2019), which reinforces several contractual principles, fully applicable to Smart Contracts, as private autonomy, the binding force of contracts, and free initiative.

Therefore, having as a reference the studies developed in this area by the Institute of Reference on Internet and Society (IRIS)¹, the researcher intended to analyze the possibility of creating an arbitration court specialized in the subject matter of the conflict, contributing to the elucidation of the problem of the judiciary's action, in face of the new technology.

Finding a way to regulate Smart Contracts, both in the conventional legal field and in cyberspace, allowing a broad understanding of the two biases is still a problem to be solved. In such a way Law, as a legal science, and its operators should contribute to the strengthening of an environment suitable for Internet innovation policies.

GENERAL THEORY OF CONTRACTS IN BRAZILIAN LAW

Contracts are within the scope of bilateral legal business, understood as the agreement of wills or needs, by which people establish a legal contract. Thus, a regulation of interests between the parties is established, an obligation that causes the creation, modification, or termination of property relations (GAGLIANO, 2016).

For the legal transaction to be valid (article 104 of the Brazilian Civil Code), the plans of existence, validity and efficiency must be complied, represented by a capable agent; a licit, possible, determinate, or determinable object and the appropriate form (prescribed or not defended by law) (BRASIL, 2002). Thus, by complying with the three aspects, the action exists, meets the elements required by law and produces legal purposes, creating, extinguishing or modifying legal relations.

Furthermore, article 113 of the Civil Code determines that the legal transaction must be interpreted in accordance with good faith, that is, the contracting parties must act according to certain standards of conduct, which are characterized by the correctness and honesty of their behavior towards the other contracting party (BRASIL, 2002).

Nevertheless, the Economic Freedom Law (Law 13.874/2019), also determines that the contractual principles of objective good faith, the social function of the contract, private autonomy, minimal intervention, mandatory binding of contracts, and the exceptionality of contractual revision must also be followed (BRASIL, 2019).

As a last analysis of the mechanism, paragraph 2 in article 113 of the Civil Code, states that “the parties may freely agree on rules of interpretation, of filling in the gaps, and of integration of the legal business other than those provided by law” (BRASIL, 2002).

The discussion about the validity of this clause focuses on the tension between the principles of private autonomy and the social purpose of the contract. According to specialized doctrine, the principle of private autonomy is based on the authority recognized by the legal system to individuals to dispose of their interests, particularly economic ones (business autonomy), freely entering legal transactions and determining their respective outcomes. Private autonomy, although it has modernly given way to other principles (such as good faith and the social function of the contract), is still the keystone of the private law system, especially in Company Law. The first premise of private autonomy is freedom as a legal value. Ethical personalism also appears as an immediate foundation, with the concept that the individual is the center of the legal system and that his freely expressed will be safeguarded as an instrument for the achievement of justice. The principle of private autonomy is materialized, fundamentally, in the contract law, by means of a triple dimension: contractual freedom, the binding force of the agreements, and the relativity of the contracts. Contractual freedom represents the power conferred on the parties to choose the business to be entered into, with whom to contract, and the content of the contractual

clauses. And the broad range of autonomy granted by the legal system to the contracting parties' expression of will (BRASIL, 2016).

The social function of the contract, as provided in Articles 421, and 422 and established as a principle of public order in Article 2.035, the sole paragraph, of the Civil Code, is projected over two aspects: the internal effectiveness, between the contracting parties themselves, and the external, beyond the contracting parties, allowing the contract to produce effects on third parties. With its internal and external projections, the social function restrains the contractual freedom regarding the content being negotiated, to the contractual clauses themselves (TARTUCE, 2019).

As for the sole paragraph of article 421, when mentioning the minimum intervention and the exceptionality of contractual revision, it reinforces the principle of the contract's obligatory force, understood by the maxim *pacta sunt servanda* (MARTINS NETO, 2019).

The Law of Economic Freedom also introduced in article 421-A to the Civil Code, which reinforces private autonomy, explicitly consigns that the parties will be free to stipulate the terms and conditions of the contracts they enter into, fixing in advance the events that may generate unpredictability, extraordinariness or excessive onerous work.

Considering the changes brought by Law 13. 874/2019, it is possible to conclude that the contracting parties have more freedom to establish the contractual conditions, as well as to maintain what was initially agreed, avoiding excessive judicial intervention and activism in private contractual relations (MARTINS NETO, 2019). Therefore, contractual revision, by the Judiciary, should be an exceptional measure, reaffirming again the principle of the mandatory force of contracts.

BLOCKCHAIN TECHNOLOGY

Blockchain technology was introduced in the article "Bitcoin: A Peer-to-Peer Electronic Cash System"; which defends the idea of a decentralized peer-to-peer payment system, through an encrypted currency named Bitcoin (NAKAMOTO, 2008). This technological innovation consists of a structure formed by computers connected to the Internet, sharing a large volume of data without the need for a specific central server. In this way, there is the emergence of a decentralized structure, in which the negotiations carried out do not require the intervention of third parties (such as financial institutions) to mediate transactions (CONCEIÇÃO; ROCHA; PAULA, 2019),

In addition to decentralization, another important feature is the validation of a certain type of transaction by unique and encrypted recognition, a feature known as Proof-of-work. Through it, the records made in the blockchain tend to be unalterable and at the same time secure, as they are impossible to be rectified in any way. Another important point is an understanding, which works as a kind of connectivity between blocks, validating the transactions of users (nodes) in a synchronized manner (CARDOSO, 2018),

Essentially, the blockchain consists of a database structure, which works with blocks in chains, carrying encrypted data. The blocks are linked in sequence and each one has a digital ID, with every block carrying the digital identity information of the previous one. Thus, when two pieces of information are connected, they generate their own digital fingerprint (TAPSCOTT, D.; TAPSCOTT, A., 2017),

This fingerprint is formed by a hash, which consists of an identification code with letters and numbers, generated by a mathematical function, that represents the data inserted into a file on the network. The hash validates the content of the blocks, and if there is any change in the data, the system will identify the error and invalidate the transaction (TAVARES; TEIXEIRA, 2017), Lastly, the data contained in the blocks is transcribed to the ledger, which stores all the transactions available in the blockchain, and, from this point on, no changes can be made, becoming immutable (CROSBY et al., 2016).

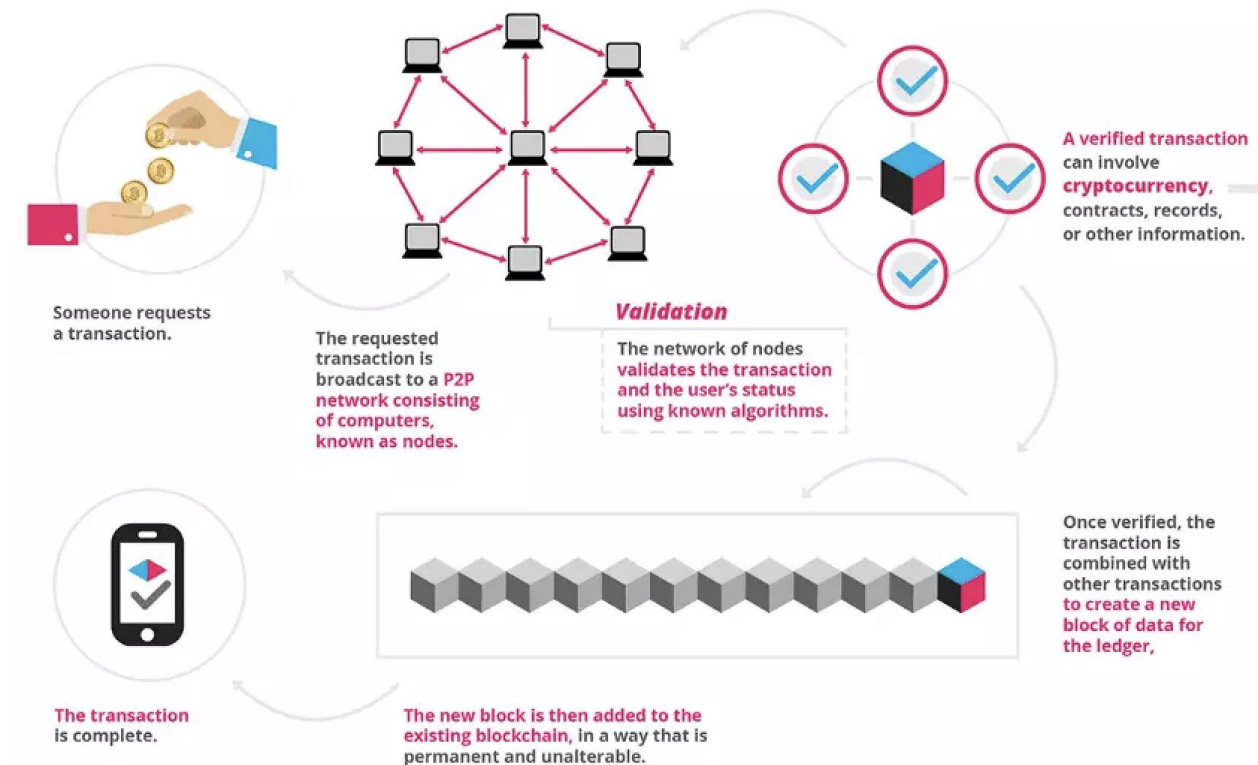
This structure replicates a financial transaction using blockchain technology.
Note that a person requests a transaction - A transfers money to B.

This instruction is transmitted by means of a crypto message to the computer network, in other words, the nodes that make up the blockchain.

The system that controls the network will verify the authenticity of the information and validate the transaction in all nodes by consensus, changing the database, generating a new block of information, altered with the information that A transferred a certain amount of money to B. This database is updated periodically through this decentralized system. (MOREIRA, 2018, p. 6).

The difficulties in altering or modifying transactions make the blockchain the most appropriate platform to host smart contracts, since it guarantees integrity and allows them to be safely executed (TAVARES; TEIXEIRA, 2017).

**FIGURE 1
BASIC STRUCTURE OF A BLOCKCHAIN**



Source: <https://www.blockmaster.com.br/artigos/guia-completo-do-bitcoin%E2%80%8Aparte-2/>

Blockchain technology has numerous applications, example of which are cryptocurrencies such as Bitcoin, which is the best known today. However, the use with likely greater impact in the legal environment concerns Smart Contracts.

SMART CONTRACTS

The term Smart Contracts was coined by the American computer scientist and cryptographer Nick Szabo, in 1996, who defined it as a set of promises, with protocols for their use, specified in a digital way

(SAENZ, 2017). In his article “Smart Contracts: Building Blocks for Digital Markets”; Szabo questions the use of traditional forms of contracts in the cyberspace era, presenting, more precisely, the concept of Smart Contracts:

New institutions, and new ways to formalize the relationships that make up these institutions, are now made possible by the digital revolution. I call these new contracts “smart”, because they are far more functional than their inanimate paper-based ancestors. No use of artificial intelligence is implied. A smart contract is a set of promises, specified in digital form, including protocols within which the parties perform on these promises. (SZABO, 1996).²

An analogy between an intelligent contract and a beverage machine can be made as a practical example. In this model, there is a creditor (individual) and a debtor (machine), each with their respective obligations. The machine is already programmed to release the beverage as soon as the payment is entered, so the creditor, when depositing the amount, fulfills his part of the contract. Then the machine prepares the beverage, also fulfilling its obligation. There is no need to tell a third party that the money has been inserted, the contract established between the parties has been fulfilled in an automatic way (DANTAS, 2019).

Therefore, Smart Contracts can be understood as contracts converted into software, programmed to automatically determine the fulfillment of their terms, and then execute the clauses or a set of rules that were previously agreed upon. That is, the participation of intermediaries becomes unnecessary, since the contract already provides what must be fulfilled and what will lead to the fulfillment or not of the provisions. This is possible, since they are written in a computer programming formula, if x, then y, that is, if a certain condition is implemented, the provision will be fulfilled (GONÇALVES; CAMARGOS, 2017).

In this new contracting model, the clauses, as they are known today, give room to the programming language, digital codes, and cryptography. Here is where the crucial difference between traditional contracts and intelligent contracts: the former are based on bits and logic with mathematical support, mainly dedicated to negotiation and execution of agreements, in a secure, automated and decentralized way; while those present their logic in legal and regulatory norms (GONÇALVES; CAMARGOS, 2017).

Thus, while a traditional contract is relatively flexible, susceptible to modification, involving interpretation and judgment, a software version is governed and predictable, allowing one to trust the contract itself, being guaranteed higher legal security (GOMES, 2018). Nevertheless, to be feasible, Smart Contracts depend on a platform where they are inviolable, being a public and decentralized blockchain the best way to enable their correct operation (GOMES, 2018),

Currently, the most used platform is Ethereum, because it was specifically designed to house Smart Contracts, providing unlimited processing capacity and application creation (FREIRE, 2017). The network focuses on the execution of programming code for any decentralized application, being the most advanced for encoding and processing smart contracts, due to the complete decentralized Turing virtual machine³, called Ethereum Virtual Machine (EVM) (FREIRE, 2017).

The EVM is responsible for executing Smart Contracts, through an international network of public nodes, thus ensuring the platform’s resistance to censorship attempts and is done with a new programming language called Solidity (BINANCE ACADEMY, 2020),

Briefly, Ethereum Smart Contracts are composed of a contract code and two public keys. The first public key is provided by the creator of the contract and the other represents the contract itself, acting as a digital identifier which is unique to each smart contract (BASSOTO, 2018).

The implementation of any contract is done through a blockchain transaction, and the contract can only be activated when it is indicated to a node (user) and executed by the EVM, according to rules previously defined in the programming (BASSOTO, 2018),

In a transaction involving a Smart Contract, the assets and terms of the contract are encoded and placed in a blockchain, being distributed and copied several times among the nodes that integrate the platform. After the process is triggered, the contract is executed according to the terms contained therein, being the implementation of the commitments automatically verified (CAMARGO, 2017),

In a hypothetical scenario of a real estate transaction, through a Smart Contract, after the parties insert the desired parameters in the contract, which will be registered in a blockchain and after the payment of the financing within the established deadline, the promise to sell will be converted into a final transaction. All happens automatically, without the need for intermediaries (notaries, accountants, lawyers or banks), solely based on the programmed algorithm. (MOREIRA, 2018).

Another case of application is insurance policies. Traditionally, the policy claims process is bureaucratic and requires a lot of human effort, raising administrative costs that are passed on to customers (CARDOSO, 2018). By using a Smart Contract, insurance policies are automated, so when the algorithm input conditions are provided about an insured event, the claims process is initiated immediately (CARDOSO, 2018),

Therefore, due to the distributed nature of Smart Contracts on the blockchain, transparency in the process is visible to all stakeholders and administrative costs are reduced (CARDOSO, 2018).

Measurable parameters of the event, such as wind speed, location of a hurricane or magnitude of an earthquake can be recorded on the blockchain. Depending on the complexity of the Smart Contract, as parameters cross certain pre-agreed thresholds, the claims process is instantly activated and the exact amount of financial payment can be delivered without the need for human intervention. (CARDOSO, 2018).

Contractual innovations raise doubts in legal science involving technical and multidisciplinary issues, which, as a rule, are not easily understood by the operator of the Law. In this regard, Smart Contracts, due to their technical complexity, which goes beyond the traditional training of jurists, have raised many problems, mainly because there are no specific laws to protect this contractual innovation, making it necessary to analyze the legal system as a whole.

NEW FRONTIERS BETWEEN THE LAW AND THE INTERNET

The initial milestone in the regulation of digital contracts occurred in 1996, with the UNCITRAL (United Nations Commission on International Trade Law) Model Law on Electronic Commerce, instituted by the United Nations Commission on International Trade Law (UNCITRAL, 1996). The initial purpose was to establish guidelines for the use of electronic means of communication that could be followed by the different legal, social and economic systems existing in the world (LAWAND, 2003). As stated in Article 5 of the aforementioned law, electronic contracts have grown in importance, being understood as contracts formally executed through electronic means, in which the manifestation of the parties' will takes place in a virtual environment (LIMA, 2004).

Electronic contracts can be divided into three categories, being intersystemic, in which the communication takes place between systems (computers) and not with the consumer; interpersonal, in which the parties, through the computer (by e-mail, video conferencing, messaging system) instrumentalize the contracting of the agreement. Lastly, they can be interactive contracts, signed between an operating system and a person (the contracts made through a website or virtual store) (LAWAND, 2003).

It is possible to perceive electronic contracts as simpler and of a practically instantaneous nature, while Smart Contracts have a higher degree of complexity, having automation as a premise, being programmed with an internal logic that is capable of making decisions.

When creating a Smart Contract, four requirements must be observed: observability, in which the fulfillment of the obligations of the contract must be monitorable; ascertainable, so that one can prove the fulfillment or non-fulfillment of the obligations; enforceable, in the sense that one can give it specific execution, including autonomously; private, meaning that the contract only produces an effect between the parties and makes it impossible for third parties to interfere, so that its existence and effects are restricted to the parties involved (SZABO, 1996).

This way, we can observe again the principle of the mandatory force of contracts, which constitutes a sort of private law between the parties, acquiring binding force (RODRIGUES, 2016).

Under current contract law, individuals are free to enter into legal transactions, creating rights and incurring obligations. Whereas private entities are given the possibility to create Smart Contracts, especially taking into consideration the Law of Economic Freedom (Law 13.874/2019) which strengthens private autonomy (BRASIL, 2019).

Nevertheless, articles 1, item IV, and 170, caput of the Constitution of the Republic (BRASIL, 1988), as well as article 2, item V, Law 12,965/2014, which addresses the Civil Rights Framework for the Internet (BRASIL, 2014), include other applicable bases for smart contracts.

Analyzing the Civil Rights Framework for the Internet, more specifically in its articles 3, item VIII, and 4, item III, it is also stated that the freedom of business model promoted on the Internet is established, with the purpose of promoting innovation and fostering the wide dissemination of new technologies and new access models (BRASIL, 2014). In this regard, it is valid to relate the freedom of business model, with article 107 of the Civil Code, which does not bind the agreement of legal transactions to a specific form, except in cases where a solemn form is required (ASSAF FILHO, 2019).

Furthermore, in this document, it is lawful for the parties to stipulate atypical contracts, in the terms of article 425, being also able to freely agree on rules of interpretation (BRASIL, 2019). Considering the absence of specific legislation regulating Smart Contracts, they can be classified as atypical, as stated in the above mentioned article, and its general rules must be applied (ASSAF FILHO, 2019).

In addition, as previously mentioned, Smart Contracts use the formula of computational programming, if x, then y, which leads to the automatic fulfillment of the opposite provision if the stipulated condition is implemented. For this reason, it is said that they are governed by the principle that code is law⁴, in which the computer code will promote the execution of the contractual terms, making it irreversible, meaning that if the parties involved, for any reason, wish to reverse the transaction, returning to the status quo, and must engage in a new intelligent contract. Being characterized for that, as self-executable and unrelated to the traditional jurisdictional powers of the State (GONÇALVES; CAMARGOS, 2017).

Due to being self-executable and immutable, it can be affirmed that Smart Contracts are governed by the blockchain principle of non-retroactivity (GONÇALVES; CAMARGOS, 2017).

It would not be possible to even consider obtaining a court order to modify, or even terminate the contract signed in blockchain. The reason is that, on one hand, the technology is created exactly to not allow the reversibility of programmed commands and, on the other hand, because a judicial decision, in the terms as currently conceived (written command), would not be able to act limiting a self-executable computer code, in which was developed the smart contract. (EFING; SANTOS, 2018).

However, this feature goes against the principle of the closeness of jurisdiction or the principle of access to justice, provided in Article 5, subsection XXXV of the CR/88, since no damage or threat to the legal right can remain outside the scope of judicial protection (BRASIL, 1988).

JUDGES AS A SERVICE

Facing the growing increase of litigation and number of cases in Brazilian courts, the Civil Procedure Code of 2015, in its article 3, reinforced the possibility of using appropriate methods of conflict resolution such as mediation, conciliation, and arbitration (BRASIL, 2015).

The first two modes are characterized by their self-compositional character, in other words, their objective is that the resolution of the dispute comes from the parties. Arbitration, on the other hand, has a jurisdictional nature, executed by an affirmative/binding command, due to the private jurisdiction (BOAS, 2019).

[...] an alternative means of dispute resolution, through the intervention of one or more persons, who receive their authority from a private convention, deciding on the basis of it,

without state intervention, being the decision intended to assume the same effectiveness as a judicial sentence. (CARMONA, 2009, p, 31),

Therefore, it is an agreement of wills of the parties in which they authorize the resolution of conflicts by non-state means, establishing a private jurisdiction, in which the arbitrator, through the arbitration sentence, utters a command with the coercive authority having the role of a judicial enforcement instrument (BOAS, 2019).

It is worth mentioning, as pointed out by the Institute of Media and Arbitration (2020) and stated in Law 9.307/1996, that arbitration can be instituted by a written arbitration clause included in the contract, in which the parties agree to submit to arbitration any disputes that may, in the future, occur in relation to that contract (IMAPR, 2020). The clause can be signed separately, in a separate term, but referring to the main contract. It is also possible through the arbitration commitment, also expressed in a written document, but current to the litigation, meaning that the parties declare their will that the already existing conflict will be solved through arbitration, without the need for a previous manifestation. (BRASIL, 1996).

A major difference in arbitration is the possibility of electing an arbitrator specialized in the subject matter of the conflict. Thus, the arbitral judgment is conferred to someone knowledgeable in a particular subject, for instance, technical notions related to smart contracts and blockchain technology, making unnecessary the technical expertise figure, which should be used by magistrates when the subject matter requires it (article 375 of the CPC).

Within this context, Pedro Vilela Resende Gonçalves and Rafael Coutinho Camargo, suggested the figure of Judges as a Service (JaaS)⁵

[...] a sort of arbitrator with the technical authority to reverse or modify transactions performed through smart contracts on the blockchain. During the elaboration of the smart contract, one or more individuals are predefined, or a mechanism that will define these individuals (who can be chosen by the algorithm through criteria such as the objective reputation of a community member, presence in a previously determined database, or who may be the creator of the smart contract itself) who will analyze the legal transaction and verify its validity. He will also have the authority to ensure its execution in accordance with the law of the jurisdiction in which the parties are included, and thus to correct any defects or nullities in the smart contract. (GONÇALVES; CAMARGO, 2017).

In other words, it would be a kind of judge with technical knowledge, able to make decisions aligned to the specifics of the area that would analyze the conditions stated by the code, considering within the logical limits of each contract, constantly paying attention to the general principles of creation and execution of contracts (GONÇALVES; CAMARGOS, 2017).

Considering the Brazilian conjuncture, a feasible way to apply the figure of Judges as a Service (JaaS), would be through the creation of an arbitration chamber and a specialized arbitration court, with knowledgeable professionals both in the legal area and in the technological area. Thus, they would be able to settle possible conflicts concerning available rights, arising from the execution of the contract, implementing through codes, the resolution given in the legal field (SALDANHA, 2019). Therefore, the arbitral judge, a person chosen by the parties in the contractual clause, would act as an intermediary, facilitating the dissolution of the litigation found by the parties in the execution of the contract, using the technical privileges to change the necessary matters, also relying on the legal strength of the arbitration decision (GONÇALVES; CAMARGOS, 2017).

It is important to mention that the Civil Procedure Code of 2015 brought an innovation with the system of precedents and resolution of repetitive claims, provided in articles 926 to 928, which constitutes a benefit to JaaS. Briefly, it was established that the courts must standardize their jurisprudence, in a coherent manner within the Brazilian legal system, in accordance with the decisions of higher courts, as well as applying certain decisions in repetitive claim incidents (GONÇALVES; CAMARGOS, 2017).

Accordingly, the current law has substantially expanded the list of decisions that will now be given a legally binding nature, giving ample value to the stability of precedents (AMARAL, 2015), which represents an advantage to the figure of Judges as a Service.

[...] the organization, classification and application of precedents can be done by using algorithms. These would verify the similarity of new claims with those previously defined as precedents, or the verification of repetitive litigation. Moreover, the registration of the decisions in the blockchain improves and ensures more security to this model. (GONÇALVES; CAMARGOS, 2017).

As these are issues that require the cooperation of highly skilled professionals in technical and legal aspects, the creation of a specialized arbitration chamber and arbitration court is the best solution to the problems presented by the blockchain and Smart Contract technologies.

RICARDIAN SMART CONTRACTS

To solve the problems faced by Smart Contracts, a new approach was sought to interconnect the technical and legal layers of the contract. This solution would allow contract clauses to be understood in computer code form by the courts, or in other words, it would make the code readable by the common people and not only by machines and their developers (EFING; SANTOS, 2018).

Ricardian Smart Contracts fulfill this role. Developed in 1995/1996 by Ian Grigg, Ricardian Contracts have the purpose of converting a traditional contract, written in human language, into an algorithm, so that it can be executed by a software (LAMOUNIER, 2018).

Therefore, Ricardian Contracts allow the analysis of more complex clauses and, therefore, subjective, due to its two interfaces, both human language, whose subjective clauses can be interpreted in the real world and programming language, not limited to the mathematical logic by conditionals (if then, equivalent to the explanation if X, then Y) (MALGUEIRO CAMPOS ADVOCACIA, 2019).

In 2015, Grigg improved his studies on Ricardian Contracts by including the concept of Ricardian Smart Contracts, which are considered to be the second generation of Smart Contracts (GRIGG, 2015). Using this type of Smart Contracts, it is possible to create a contract readable and auditable by humans, which will later be inserted into a software with encrypted language, that will be recognized by the blockchain and then automated (MALGUEIRO CAMPOS ADVOCACIA, 2019).

According to the Ricardian method, the structure of a Smart Contract must include three elements: parameters, prose and code (HAZARD; HAPIO, 2017). The parameters are defined by the parties and individualize the operation, such as the object of the contract and the deadline. The prose is the contract in human language. Meanwhile, the code, is the algorithm that will allow the execution of the obligations. "Thus, the party inserts certain parameters, which must be, on one hand, converted into code so that they can be understood and executed by the computer and, on the other hand, result in a traditional contractual instrument, written in prose". (MOREIRA, 2018, p. 16).

Ricardian Smart Contracts use templates or document models, which connect the parameters, the prose, and the code. These templates can be elaborated based on traditional contracts, representing the same obligational structure (MOREIRA, 2018). In this model, the parties insert the parameters of the transaction (object, price, term, etc.) in the template that converts them into codes to be interpreted by Smart Contracts allowing the fulfillment of a certain function, the higher the number of parameters, the more complex the code will be. Furthermore, in parallel, the template creates a traditional contractual instrument, which will be integrated to the code with the peer to peer (P2P) blockchain technology. (MOREIRA, 2018).

Thus, with Ricardian Smart Contracts we have the creation of a system with greater flexibility, which enables the technical and legal interaction, allowing the understanding of clauses and computer codes by the courts.

In this regard, the Judicial Power must adapt to the disruptive innovation, being of extreme importance the interdisciplinary with technology experts, as well as the investment in platforms capable of creating, storing, and adjusting the Smart Contracts.

CONCLUSION

As a result of the aspects discussed, it is clear that the legal implications resulting from the execution of Smart Contracts have not yet found an answer in the Brazilian legal system, due to the technical complexity involved. Therefore, further studies involving Smart Contracts and blockchain technology are imperative, aiming at a better understanding of the issue, as well as its feasibility and effectiveness within the legal system.

With the Law of Economic Freedom (Law 13.874/2019), a movement in favor of the use of Smart Contracts can be noticed, since the parties were given more autonomy to agree and interpret a contract (BRASIL, 2019). Moreover, the Civil Rights Framework for the Internet promotes innovation and the wide dissemination of new technologies and new models of access, which encourages the use of this new form of negotiation.

Note, however, that the major obstacle to the adoption of this technology is, at the same time, its greatest advantage, which is its immutability that provides, on the one hand, greater security for contracting parties and, on the other, a risk to the traditional jurisdictional powers. Therefore, while traditional law is relatively flexible, involving interpretation and judgment, and may be modified, the software version is inflexible, governed by the Theory “The Code is Law” and the Logic “If Then”.

A possible solution, comprehending the technical and legal layer, that may solve the problem mentioned above is the one brought by the Code of Civil Procedure, with the system of precedents and resolution of repetitive claims, which is entirely feasible to be applied by using algorithms, combining the ‘legal code’ with Lessing’s theory (The Code is Law), effectively making the code as a faithful representation of the law and its jurisprudence.

However, the use of mechanisms such as Judges as a Service and other similar mechanisms is still essential. This is due to the technical knowledge of the arbitral judge, which allows him to act directly with the programming language. Nevertheless, it is essential to adapt it to the norms of Brazilian law.

In light of the above, Ricardian Smart Contracts can be understood as the answer to the core of the question, given their two interfaces, which allow the understanding of contract clauses in computer code format by the courts. This way, it is feasible to create a contract with subjective clauses, which are not restricted to conditional logic, being revisable and, simultaneously, encrypted, providing security to the business.

In this regard, it is still imperative to adapt the Judicial Power to the new concepts, requiring the development and investment in platforms capable of housing the Ricardian Smart Contracts, as well as interdisciplinarity with experts, in order to establish guidelines for the use of contracts, in addition to conferring greater security to the Judiciary.

ACKNOWLEDEMENT

Translated & edited by American Publishing Services (<https://americanpublishingservices.com/>).

ENDNOTES

1. IRIS is an independent research center founded in Belo Horizonte, Minas Gerais that seeks to investigate the Internet’s effects on contemporary society.
2. Original text: “New institutions, and new ways to formalize the relationships that make up these institutions, are now made possible by the digital revolution. I call these new contracts “smart”; because they are far more functional than their inanimate paper-based ancestors. No use of artificial intelligence is implied. A smart

contract is a set of promises, specified in digital form, including protocols within which the parties perform on these promises.”

3. Turing-complete - In the theory of computation, a system of data manipulation rules, as in a set of inputs, is said to be Turing-complete. It is a computational system, which can compute any Turing-computable function (FREIRE, 2017).
4. Theory presented in the book “Code and Other Laws of Cyberspace”, from Harvard Law School cyberlaws professor, Lawrence Lessig, For Lessig, the cyberspace code, that is, its architecture, is a law, meaning it is a compilation of rules of social conduct accepted by the participants (KAMINSKI, 2001).
5. Literally translated from the Brazilian “Juizes como um serviço”

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