

Analysis of the development approach and implementation of the service tokenization project. Hoteliers project Ocean Blue Corp - Hotel Best Wester Quito - Ecuador city and beach

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Abstract

The present work, explores from the nature of Civil Law and the source theory of legal obligation, towards the evolution of development of *Smarts Contracts* and *Blockchain* Technology in the implementation of a system of RC20 and RC21 token issuing machine, with fiduciary support as a mechanism of legal security in order to propose a model of potentialization of destinations with high tourism demand in developing countries, within the framework of design, implementation and commissioning of the destination Hotel Aiden by Best Western Quito DM, Republic of Ecuador City and Beach.

Keywords: Smart Contracts; Smart Tourism; Tokenization; Blockchain; contractware

Introduction

By way of introduction, we start by determining the legal nature of subjective rights as a source of contractual obligation, on the basis that they are faculties or powers that people have to demand something from someone or from the State. They can be defined as legal powers, granted by the legal system. The doctrine set forth by Llambías (1997), points out as a prerogative recognized to the individual by the legal system, whose purpose is to generate a relationship of enforceability towards the other persons or subjects of the legal relationship.

The legal nature of obligations is understood as a bond that requires the debtor as a subject obliged to give, do, or not do something in favor of another person called creditor. Giving rise to an acceptance, which is called obligation susceptible of pecuniary estimation. Thus, and in accordance with Betti's statement [1], the obligation is a patrimonial commitment to another.

Louis Josserand (1950), states that an obligation or personal right is a legal relationship that assigns to one or several persons the position of debtor before others who play the role of creditors and with respect to whom they would be obliged to a positive performance, determined by an obligation to give or to do, and in a negative form of not doing.

On the nature of the contractual legal obligation to. contractware, in contracts for the provision of hotel services

Nick Szabo (1996), in “*Extropy*”, *Building Blocks for digital free Markets*, proposes the modulated functionality of a vending machine, and manages to project the contractual nature towards a model based on the mechanical and digital advances of his time, proposing in conceptual terms the automation of increasingly dynamic contracts, his modulation was based on *hardware and software systems*, which would come to emulate the cycle of beginning and end of the pre- and post-contractual stages, proposing the replacement of human intervention in the contractual act.

Under the modulation proposed by Szabo (1996), the vending machine in its functional cycle of constant operation fulfills two natural and contractual requirements of a service provision process, it delivers the good or service, for a fair price, so that on the one hand it executes the payment and on the other it dispenses or delivers the product, with criteria of security and autonomy in this contractual, constant, dynamic and automatic process.

This simple but at the same time complex legal and IT situation, inspires the development of the present project, because if the dynamics emulated by Szabo focused on *Blockchain* technology, is transferred to the contractual terms of service provision interconnected to the computer code, which through the interface of a token express the will of the parties, the substantial elements of both the legal obligation and the nature of the contract are being integrated.

In this order of ideas, starting from the dynamics of smart contracts with two phenomena of great furor in the dynamic boom of commerce, with different concepts in form, but interrelated in practice, *Blockchain*, *Smart properties* and *smart tourism*, with a proposal for the conformation of an ecosystem of service provision and legal security.

The implementation of technological mechanisms in the provision of services has become an indispensable tool that not only responds to the social reality of the moment, but also presents itself as a prerogative that can also be used by developing destinations, but with high tourism potential, seen as a whole.

Blockchain provides us with a relevant technological security, and this is one of the most relevant parameters when using the technology for example for financial markets. This new technological era offers us an internet of value, now the web is not only informative, it will not only circulate with data, but we will be able to create value within the network and within the *Blockchain*.

The way of validating transactions and circulating information allows us to create assets that are unique, referenced within the Blockchain itself and when we transmit an asset we lose it. For example, when an information file is sent to any recipient it can be PDF, it can be cloned and sent to many recipients, the sender has the control and power to do with that file whatever he wants. When using Blockchain technology by using Bitcoin transfer for example what happens is that the issuer loses control and power over that asset that is the Bitcoin, therefore, you can create value, and you can store, or transfer because they become codes that are unique and of which you lose control when you decide to transmit them.

Blockchain and Hotel Services

Blockchain is conceived as an IT tool that enables the implementation of “distributed registries”, for the purpose of this article, a distributed registry should be understood as a registry that is constructed in such a way that the annotations that integrate it are agreed among the anonymous participants in its creation, with the peculiarity that each of the participants has an updated copy of this registry, which is universal and unique. This distribution pattern can be used for the creation of other registers, which can and must be mathematically and legally represented.

For the purposes of this research, a “distributed registry” is understood as a registry that is constructed in such a way that the annotations or value that comprise it are agreed upon by the anonymous participants in its creation. In addition, each of them has an updated copy of it. This “proof matrix” has been used to optimize costs in cryptocurrency transfer. It can also be used for the creation of other “crypto-registers” as long as the elements that make them up can be mathematically represented, establishing a contractual, dynamic and evidential procedure for the generation of obligations between the parties, both in the use and in the provision of the service.

It is necessary to expose one of the basic and most important components of Blockchain technology, and that is decentralization. Decentralization is one of the fundamental principles of the *Blockchain* process, it consists in the fact that all transactions and operations are recorded in a distributed network, which means that there is no central authority or entity that controls that network. Instead, the information is stored in multiple nodes or devices that are part of that network, and that work together to verify and update the transaction record. Each node in the network has a copy of the entire *Blockchain database*, ensuring that there is no single point of failure or vulnerability.

Decentralization in the *Blockchain* process has several advantages, including security, transparency and resistance to censorship or manipulation. With no central authority in charge of the *Blockchain* network, transactions are more secure and harder to hack. In addition, the transparency in the network makes it easier to track transactions and detect any suspicious activity. With no central entity that can censor or manipulate information on the network, decentralization offers greater resistance to potential abuses of power or hidden interests.

It now corresponds to describe the conceptualization for the present project of the smart property or crypto property-service in the model implemented, once the distributed registry for the exchange of currency has been dynamized, it corresponds to propose which related rights could be transferred within the framework of this implementation system. In general terms, *tokenization* is the mathematical representation of a right of use or property, in a sequence of characters (letters and digits), which are unequivocally incorporated into a distributed registry.

The represented rights of use or *tokens*, with full capacity to transfer the ownership of a right, represented in digital form, but with full capacity for its use and execution, as a simplification of the transmission of a service, under unique and own criteria of non-fungibility.

In this digital environment, the tokens, and their representation in goods and services that grant legal title to the specific act object of the provision, making it susceptible of transmission to new holders under the contractual terms established in the *smart contract*. The virtue of *Blockchain* technology in this interface of emulation of decentralized transfer of goods and services, guarantees the uniqueness of each transaction, and its integration to the block chain of distributed occupancy.

The last substantial element of this ecosystem is implemented in the *Smart contract*, with the core elements of the contractual obligation, towards the development model approach, the *Smart contract* [2] is a computer program that runs autonomously and automatically on the Blockchain. These contracts are designed to automate the process of verifying and executing transactions and to make agreements transparent, secure and tamper-proof. A *Smart contract* is written in a programming language and embedded in the *Blockchain* so that it can be executed anytime and anywhere on the network.

At this stage of tokenization, the aim is to apply *contractware* [3], which involves the transfer of the contractual dynamics to a computer code, migrating to the nature of the substantial elements of the contract, the obligations of the contracting parties, and the consequences of the observance or non-observance of the contract.

Contractware is a term that refers to the codification of the terms and conditions of a contract in a computer program. It consists of the transformation of a conventional contract into a computer code that can be automatically executed to implement and guarantee the agreed conditions. The term contractware is commonly used in the context of Smart contracts, which are computer programs designed to automatically execute the terms of a contract on a Blockchain. Smart contracts use contractware to incorporate the terms of the contract into computer code that can be executed if previously defined conditions are met.

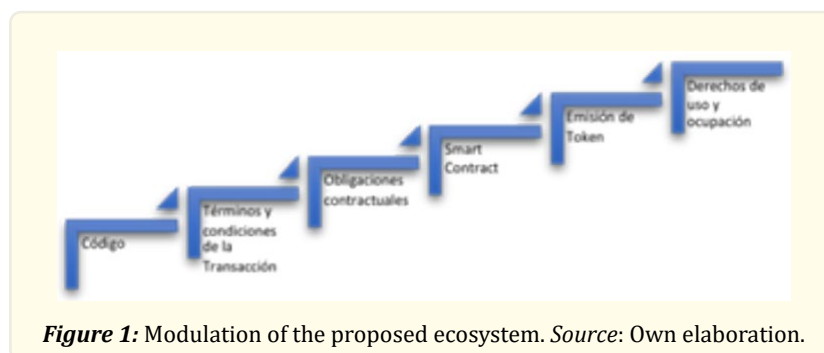


Figure 1: Modulation of the proposed ecosystem. *Source:* Own elaboration.

In the graph, the form of transfer of a token is determined, since the smart contract is not limited to stating the transfer agreements, it also verifies the data and executes the legal consequences agreed upon by the contracting parties, thus if the code receives the parties' services (payment in crypto *exchange*) and the token transfer mandate, it refers to each of the parties for the perfection of the contractual model, delivery of the good or service, and payment of the fair price.

Activation Cycle of Smart Contracts for the provision of Hotel Services

In the nature of the contractual act, provision of services, its cycle of conditionality and validity contains three phases: the first is the generation of the contractual will, the second is the perfection of the legal act, and the third is the consummation of the act of the will of the parties. Within the implementation of the decentralized system under *contractware* criteria.

The first phase of the nature of the contractual act, the generation of the contractual will, refers to the process in which the parties involved manifest their intention to establish a contract and express their consent to do so. This phase involves the following aspects:

1. *Offer*: One party makes a specific and clear proposal to the other party, indicating the terms and conditions under which it is willing to enter into the contract. The offer must be sufficiently precise and complete for the other party to accept or reject it.
2. *Acceptance*: The other party involved responds to the offer in an affirmative and unreserved manner, accepting the terms and conditions set forth. Acceptance must be a clear and express manifestation of agreement with all the essential elements of the offer.
3. *Consent*: Both parties must have the legal capacity to enter into the contract and must give their consent freely, without being subjected to coercion or fraud. Mutual consent is essential for the contractual will to be valid and binding.

During this phase, clear and effective communication between the parties is crucial to ensure that both parties understand the terms and conditions of the proposed contract. In addition, any negotiations, modifications or counter-offers also take place at this stage before a final agreement is reached.

In the contractual context, the second perfection of the contract refers to the stage at which the final and binding agreement between the parties is reached. It consists of the following key elements pertaining to civil law.

1. *Offer and acceptance*: After an offer is made by one party and accepted by the other party, a preliminary agreement between the parties is generated. However, this preliminary agreement is not binding until certain additional requirements are met.
2. *Formal requirements*: Depending on applicable laws and regulations, it may be necessary for the contract to comply with certain formal requirements in order to be valid and binding. These requirements may include the written form, the signature of the parties or the presence of witnesses.
3. *Full consent*: Both parties must give full consent free of defects, such as error, fraud or violence. The consent must be valid and free of vices for the contract to be considered valid.

The third phase refers to the consummation of the act of will of the parties. This phase implies that all the conditions and requirements established in the contract are fulfilled, and that the parties perform the agreed obligations.

The consummation of the act of the will of the parties implies the following:

1. *Fulfillment of obligations*: Each party involved in the contract must carry out and fulfill the agreed obligations. This involves performing the actions, providing the goods or services, or performing any other activity stipulated in the contract.
2. *Compliance with deadlines and conditions*: The parties must comply with the bonds established in the contract and respect the specific conditions agreed upon. This includes meeting delivery deadlines, scheduled payments, confidentiality clauses, among other agreed terms and conditions.
3. *Record of performance*: It is common for the parties to record the performance of the contract through documents, reports, invoices, receipts or other records evidencing compliance with contractual obligations.

The consummation of the parties' act of will marks the point at which the performance of the contract is complete and what has been agreed by both parties is satisfied. At this stage, the parties can review whether all conditions have been satisfactorily fulfilled and, if necessary, take appropriate action to resolve any problems or non-compliance.

It is necessary to pre-establish for this development model the conceptualization of "oracle", understanding this as a computer program that in its structure intends to conceive a series of variables conditioned to specific and contemplated cases, unknown at the moment and conceived as future data, which condition the result of the code execution, in the implementation model proposed when the *contractware* is created.

In other words, an "oracle" in the context of computer science and technology refers to a computer program or software component that provides information or answers based on predefined data and rules. Its purpose is to provide a specific output or response based on input variables or set conditions.

The term "oracle" is used metaphorically to refer to the idea of a system or entity that has specialized knowledge or wisdom and can provide reliable and accurate answers to questions or situations posed.

For the present development model, we take as a starting point the rules on electronic commerce referred to by the United Nations Commission on International Trade Law [4], this commission assumes the challenge of the exponential growth of electronic relations in the international traffic of goods and services, through the creation of various instruments based on the principle of functional equivalence between the electronic document and the physical document, and the principle of technological neutrality.

This frame of reference will be in the immediate future the basis for the generation of legislative initiatives in the field of smart contracts, taking as a starting point, electronic transferable documents, in emulation of securities. In this way, the representation of goods and services associated with international trade will become a reality.

Collaborative economy and Blockchain in the provision of Hotel Services

The collaborative economy, as a reference of the new systems of production and consumption of services and goods derived from the advances of information technologies, to exchange and share through technological platforms, based on exponential economic development and welfare in a non-linear way and under the applicability of the type of performance of *Product Service System*, which provides the consumer with access to the services they require in a precise way, under the modality of service provision, or otherwise the approach of the right of use of memberships, under trusteeship administration support, as a security guarantee mechanism.

In this context, the implementation project intends to start from the concept of collaborative accommodation service provision and assignment of use of accommodation services autonomously, through *peer-to-peer platforms* [5], singularized to precepts of booking, accommodation, exchange of the service, through the use interface of *blockchain* technology and *tokenization* of hotel service provision

in the framework of the exponential development of *smart tourism*.

Peer-to-peer (P2P) platforms are computer systems that allow users to share resources, files or services directly with each other, without the need for a central authority or intermediaries. These platforms are based on direct connection and collaboration between users. Instead of using a centralized server to store and distribute information, P2P platforms allow resources to be distributed across multiple nodes or individual computers. Each node acts as both a resource provider and a consumer, allowing the sharing of files, data, bandwidth, storage capacity or other resources.

P2P platforms have been widely used in various contexts, especially in file sharing. A popular example of P2P platforms can be seen in Skype: The communication application Skype uses a P2P architecture to facilitate calls and message exchange between users. Instead of going through a central server, calls and messages are routed directly between users' devices, enabling faster and more decentralized communication.

Based on the concept of collaborative accommodation, conceived as an alternative to conventional tourism and from the vision of *Smart Tourism and Smart Travel*, this can be enhanced with the application in the implementation of *Blockchain* technology and *Tokenization* of services under the support of the traceability of trustee assets as a mechanism to guarantee legal security, thus implementing the advantages towards large-scale marketing services and with criteria of supranationality to global markets, as an instrument to generate collaborative economy.

Specific case

In this conceptual framework, the implementation project of *Tokenization* of hotel services operations called "Blue Ocean Project - Best Western Quito city and beach", allows to put in context the first project of marketing of non-fungible *tokens* with trustee support, and with *Blockchain* technology in the Republic of Ecuador. As a model of concept development, implementation, and implementation of this collaborative economy process in developing countries with high tourism potential.

From the functional architecture scheme for the implementation of the project based on *Blockchain* technology whose main objective is to register rooms, control the use of hotel occupancy in the form of Smart Contract, under implementation of ERC-721 non-fungible *token* standard model, which will allow these rooms can be booked through a NFT system. where it seeks to deploy different *Smart Contracts* based on *tokens* in both ERC20 and ERC721 standard models, whose functionality allows buying and selling NFT both with fiat money and cryptocurrencies.

An NFT (Non-Fungible Token) system refers to a type of digital token that is used to represent the ownership or authenticity of a unique object or asset in a digital environment. Unlike cryptocurrencies such as Bitcoin, which is fungible and can be exchanged for equivalent units, NFTs are unique and indivisible. The key feature of NFTs is that they use *Blockchain* technology, as a decentralized and immutable registry that guarantees the security and traceability of digital assets. Each NFT has a unique identity and is recorded on the blockchain, which allows verifying its authenticity and ownership.

In the first phase of development to determine the technical feasibility of the project, two functional and harmonic alternatives are proposed, the first is to create the NFT in a *Blockchain* compatible with the Ethereum Virtual Machine (EVM), and the second is to create this NFT in several *Blockchain* networks and centralize the management in another Blockchain, under criteria of high commercial standardization, for the implementation of the proposed model.

It is recommended to create a central *Smart contract* that registers all operations in a single blockchain, and that added to its integration in several *Blockchain* networks (Ethereum, Tron and others compatible with EVM), centralizes the management in another *Blockchain*. Under a central *Smart contract*, backed in trustee administration as a figure of legal security, in other words, that the operations of all blockchains are recorded in a single blockchain.

To implement this solution, a smart contract is proposed in the central *Blockchain*, which interacts with the smart contracts in each

of the secondary *Blockchains* where the NFTs will be issued. This centralized smart contract is in charge of keeping a record of all transactions related to the NFTs, it also updates the information of the rooms available for booking, as well as the availability of memberships under the *time sharing* model management modality.

As part of this integration and implementation, when a user makes a reservation through one of the EVM-compatible blockchains, an NFT will be created on that specific *blockchain*. The centralized smart contract will take care of recording this transaction in its registry and update the availability of hotel rooms on all supported and adhering *blockchains*.

Thus, the proposed model, so that users can buy and sell these NFTs, has to aim at the creation of a centralized platform that interacts with the smart contracts of each compatible blockchain. On this platform, users can buy and sell the NFTs using both fiat money and cryptocurrencies, and transactions will be recorded in the centralized smart contract to keep a total record of all transactions.

As it is, the TRC-721 *Smart contract* in TRON will have a similar structure to Ethereum's ERC-721 *Smart contract* that will include a list of the current owners of each NFT, as well as information about the creation date, the value of the NFT and any other relevant information. In addition, this *Smart contract* will have methods that allow for the creation of new NFTs, the transfer of NFTs between accounts, and verification of the authenticity of an NFT. It will also include a method that allows communication with the centralized *Smart contract* on Ethereum to record transactions on both networks.

Finally, to enable *inter-blockchain* token transfer, it is necessary to use a *chain bridge* that acts as a communication channel between two different blockchains. This chain bridge will be responsible for validating and recording the *token* transfer transaction on both blockchains. The interface solution intended by this technical development to implement *inter-Blockchain* token transfer is based on:

- a. Creation of the token on the chain of origin: the ERC-721 token must be created on the chain of origin and the corresponding property rights must be assigned, under the establishment of the right of use and its interrelation with the fiduciary guarantee.
- b. Chain bridge initialization: a chain bridge must be initialized on both blockchains to enable *inter-Blockchain* transfer of tokens.

Perspective of the right of use of hotel services and its legal relationship to the *smart contract*

From the legal perspective, integrating the computerized nature of the technology of implementation of *Smart contracts* into the blockchain, it advocates the existence of a given right that is born with the purpose of producing legal effects. Thus, the *Smart contract* integrated to the blockchain, would execute an act of contractual will drafted in whole or in part in form (or computer language), whose clauses determine the obligations to which the parties submit themselves in whole or in part to an existing legal relationship, the same system being responsible for its automatic execution when the fulfillment of the agreement is verified.

From this perspective, the *Smart contract* proposed for the present project poses a conceptual challenge for the civil legal doctrine. First, the integration of the object of the contract and its regulation in the normative framework, always maintaining the substantial elements of the contract, in form and substance in the terms of the Civil Code, regarding the nature of the obligation and the consideration for the service.

Under this order of ideas, we conceive collaborative hosting for this development as a right of use, which arises from an act of contractual willingness to provide a service, in an activity issued and transferred based on algorithms and computer protocols, based on the right of use represented by the token. For this it is necessary to distinguish between the *right to a token*, or the right of ownership of the token, as in the case of cryptography, to the rights it represents, in this particular case the real right of use in the contractual terms of the *smart contract*, with respect to third parties, and to the right of ownership of the *token* as an asset, as well as to the issuer of the *token*.

Consequently, the present implementation project intends to expose the natural concepts of pre-contractual and contractual acts of a legal relationship of commerce, integrated to the right of use, from a cryptographic and interactive perspective in a system that carries a process of conceptual and commercial technological integration towards destinations in developing countries.

Which is finally, what encourages the exploration and implementation of existing conceptualizations and regulated in the general civil norm in matters of real rights, credit rights, according to its material scope of application, with criteria of cybersecurity in the protection of data of the chain, as of the relations of the *Exchange*, both in primary and secondary markets. Always guaranteeing the traceability of use, and the fiduciary administration as a substantial element of legal security, towards the promoter, the developer and user of the project, in favor of the dynamization and automation of legal traffic in the consumption of services at international level as a destination for promotion in developing countries, all within the framework of protection of consumer rights.

Notes

1. "The obligation is the patrimonial content of the performance owed by the debtor to the creditor. The obligation is not primarily a legal relationship, as are the contract or the legal bond that binds the parties; it is a relationship between two things, between the fact of enrichment and the fact of impoverishment that the law places face to face" BETTI E. *Teoría General del Negocio Jurídico*. Buenos Aires: Editorial Universitaria de Buenos Aires (1955).
2. "Smart contracts are mainly based on Blockchain technology. Proof of this is that they share many characteristics with it, such as unchangeability, transparency, security or pseudonymity. For this reason only the specific characteristics of smart contracts will be analyzed now, in order to avoid superfluous reiterations. We can mainly point out that smart contracts are autonomous, which means that they do not require the intervention of the parties for the services that comprise them to be executed. They use a computer language that must be translated into the common language, so that any average citizen can understand its content. Otherwise, the contract could be annulled, as there is a vitiated consent" SÁNCHEZ ÁLVAREZ E and GARCÍA PACIOS A. *Blockchain technology and electronic contracting: critical points of integration of the so-called smart contracts in our contract law system*. In *Revista CEFLegal* 246 (2021): 71-98.
3. "Contractware is the translation of legal (contractual) prose into computer code. The coding incorporates not only the agreements reached but also the consequences that may arise from their fulfillment or non-fulfillment. If, for example, the transfer of a token is formalized, the smart contract is not limited to stating the transfer agreements. It also verifies the data and executes the consequences agreed upon by the signatories. Thus, for example, the code receives the parties' performances (the payment in cryptocurrencies and the token transfer mandate) and forwards to each party the other party's performance. Many authors reject that these sequences of code can be considered authentic contracts, since while simple contracts merely incorporate promises of future performance, intelligent ones execute them".
4. "The United Nations Commission on International Trade Law (UNCITRAL) has developed a set of legislative texts to enable and facilitate the use of electronic means in commercial activities, which have been adopted by more than 100 States. The most widely adopted text is the UNCITRAL Model Law on Electronic Commerce (1996), which sets out the rules for equal treatment of electronic and paper-based information and legal recognition of electronic transactions and processes, based on the fundamental principles of non-discrimination in the use of electronic means, functional equivalence and technological neutrality. The UNCITRAL Model Law on Electronic Signatures (2001) provides further rules on the use of electronic signatures. The United Nations Convention on the Use of Electronic Communications in International Contracts (New York, 2005) takes as its point of departure the earlier texts of UNCITRAL to become the first treaty to give legal certainty to electronic contracting in international trade.
More recently, the UNCITRAL Model Law on Electronic Transferable Documents (2017) applies the same principles to enable and facilitate the use of transferable documents and securities in electronic form, such as bills of lading, bills of exchange, checks, promissory notes and warehouse receipts.
In 2019, UNCITRAL approved the publication of the Notes on key issues related to cloud computing contracts, while continuing to work on the development of a new instrument on the use and cross-border recognition of electronic identity management services and authentication services (trust services)".
5. "P2P technology can be defined as a network in the form of a backbone, composed of nodes that act as clients and servers of other nodes. When a client enters this system", it makes a direct connection to one of the latter, where it collects and stores all the information and content available for sharing. It is then a program whose function is to connect users through a serverless network

that facilitates the download⁵³ of music, movies, books, photos and software among all other users, free of charge. These files are shared “from computer to computer” by the mere fact of having access to the system”. VARELA PEZZANO, Eduardo Secondo. *Peer-to-peer technologies, author’s rights and copyright*. Bogotá: Editorial Universidad del Rosario 2009.

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Regulations

1. UNCITRAL Model Law on Electronic Commerce Guide to Enactment 1996 with new article 5 adopted in 1998.
2. UNCITRAL Model Law on Electronic Signatures with Guide to Enactment 2001.
3. UNCITRAL Model Law on Electronic Transmittable Documents 2017.