Article

Blockchain for civil mediation in conflicts in condominiums

Cristina Argelich-Comelles

Faculty of Law, Autonomous University of Madrid, 28049 Madrid, Spain; cristina.argelich@uam.es

Abstract: This paper foresees a critical analysis and development of a legislative proposal for the effective implementation of blockchain technology in Civil Mediation in conflicts in condominiums. This paper provides a legal analysis of personal, property rights and condominium disputes, applying blockchain technology for the purpose of self-executing civil mediation. This paper provides several solutions for conflicts in condominiums: Condominium Statute in blockchain, telematic attendance and voting systems, the self-execution of civil mediation agreements in conflicts in condominiums and Tokenization and IoT for property remote control in condominiums. The novelty of this research lies in the fact that, based on the experience of civil mediation in conflicts in condominiums, foreseen in US States and in other States such as Canada, Spain, the regulation is adapted for the correct application of blockchain technology for mediation in conflicts in condominiums.

Keywords: blockchain technology; mediation; condominiums; civil law; private law

1. Introduction to civil mediation and blockchain technology

Civil mediation has some common characteristics regarding mediation in other areas, considering the EU regulation provided for in Directive 2008/52/EC of the European Parliament and of the Council of 21 May 2008, on certain aspects of mediation in Civil and Commercial matters, transposed by the Spanish Civil Mediation Act, which is binding on cross-border disputes involving nationals of EU Member States. The Spanish Civil Mediation Act has extended the scope of application to any cross-border dispute, and is applicable to conflicts in condominiums. Civil mediation as an ADR provides for an out-of-court agreement made by the parties regarding a dispute, in order to solve it by self-executing the mediation agreement. The objectives of this paper are to examine several conflicts in condominiums, and the implementation of blockchain technology in civil mediation in conflicts in condominiums, because of its immutability and transparency, as well as in housing management, considering the Spanish case in the comparative context.

Condominium disputes are an extensive issue, affecting communities globally, so that it is necessary to standardize practices and to enhance cross-border dispute resolution. Thus, the implementation of blockchain technology in civil mediation for conflicts in condominiums is significant, as well as presents inherent complexities and feasibility challenges. Blockchain technology offers the potential to automate mediation processes, reducing time and costs involved in resolving disputes, provides for a transparent record of agreements, ensures the security and integrity of mediation data, and protects sensitive information.

Regarding the application of blockchain technology for self-execution of mediation agreements in neighbourhood disputes, it is important to point out several aspects, before examining legal conflicts in condominiums, as the research gaps that

will be assessed through several IT findings. Blockchain technology is an immutable and rigid due to its inherent characteristics like decentralization and cryptographic security, so that once information is recorded on the blockchain, it cannot be altered or deleted, except for re-programming. The Ethereum platform (Al-Bassam, 2018) makes it possible to create personalised smart contracts, whose agreements can be automated in blockchain. Ethereum allows to create a Condominium statute in blockchain (Allam, 2018; Kemp, 2018; O'Shields, 2017), so is therefore the ideal platform for monitoring compliance of mediation agreements in this context. Through this platform, the different agreements are self-implemented to the platform in the form of input, to generate outputs to self-execute and control compliance. Therefore, this mediation agreement can be described as "personalised", as it is configured using Ethereum. Ethereum, however, has an economic cost: users must pay fees in Ethers for each operation they activate (Ocariz, 2018).

2. Civil mediation in conflicts in condominiums: The Spanish case in the comparative law perspective

Considering the Spanish case in conflicts in condominiums, personal conflicts and neighbourhood conflicts in the Comparative Law perspective will be examined.

2.1. Personal conflicts in condominiums

The obligations of the co-owner in a condominium consist of the following actions. Firstly, to contribute to the general expenses for the adequate maintenance of the condominium, its common facilities, charges, and responsibilities that cannot be individualised according to their co-ownership shares, according to Art. 9 Spanish Condominium Act. Secondly, to observe due diligence in the use of the property and in relation to the co-owners, according to Art. 9.1 a) Spanish Condominium Act. This includes respecting the common facilities and not engaging in prohibited activities. Thirdly, consenting to the carrying out of repairs required by the whole property, in accordance with Art. 9.1 c) Spanish Condominium Act. This includes allowing access to the dwelling if necessary and allowing easements necessary to carry out common works, with the right to compensation. Finally, to provide the so-called "book of the building" for the Land Registry, according to Art. 202 Spanish Land Registry Act. The right to use does not allow the right to sell separately a common element, according to Art. 396.2 Spanish Civil Code.

2.1.1. Civil mediation in co-ownership division in condominiums

Regarding civil mediation in co-ownership division in condominiums, Art. 392 Spanish Civil Code defines community of goods as the ownership or a right belonging pro indiviso to several owners. Consequently, the object of the community of property will be the common good, which may or may not be divisible. For this reason, Art. 400 Spanish Civil Code provides that no one can be obliged to remain in a co-owned property, because of conflicts in its management. These conflicts can be mediated, and it depends on its divisibility or indivisibility.

The legal treatment of the divisible co-owned good is distributed according to whether it concerns movable or immovable property. In the case of immovable property, these real assets have a public deed and its corresponding entry in the Land

Registry. Conflicts may arise over the distribution of the property once has been divided. The judicial alternative is to make plots of equal economic value. Civil mediation in this matter makes it possible to disregard the economic criterion to attend to a criterion of a personal nature, for example, to allocate it for residential reasons.

On the other hand, if civil mediation in this area concerns movable property, the proof of ownership may already involve a conflict, except for it is entered in the Movable Property Registry. In the case of movable property with an economic value, mediation considers its affective value, rather than the economic value. On the other hand, if it is an indivisible co-owned good, as distribution is not possible, conflicts arise when the economic value is determined in the sale to one of the co-owners (Gil, 2013). The case law solutions include the judiciary value and auction, which can reduce by up to 50% of its value.

2.1.2. Civil mediation in housing lease conflicts in condominiums

The economic crisis caused by the COVID-19 pandemic, according to Nassim Taleb's black swan theory (Taleb, 2007), clarifies that it is necessary contract adaptation in housing lease, instead of remedies for breach of contract. As for the contract remedies, the rebus sic stantibus clause could be used for contract adaptation: the Italian theory of the eccessiva onerosità or hardship (Parra Lucán, 2015; Salvador Coderch, 2009), incorporated in Art. 6.2 of the UNIDROIT Principles and which implies contract renegotiation; the French theory of imprévision or unforeseeability; and the German theory of Geschäftsgrundlage or of the basis of the contract (Larenz, 1963), provided for in §313 BGB, for the case of the disappearance of the subjective or objective basis of the contract. There are many contract terms in housing leases regarding permanent residence that could be adapted by means of the rebus sic stantibus clause, as with civil mediation in housing lease conflicts in condominiums, to solve disputes regarding black swan events, is in the former pandemic (García Rubio, 2020), more appropriate than force majeure (Ganuza and Gómez Pomar, 2020) regarding personal contracts terms. For this reason, civil mediation for housing lease conflicts in condominiums will be assessed regarding Spanish Regulation on Housing Lease.

The Art. 9 Spanish Regulation on Housing Lease establishes a minimum lease term of five years for natural persons and seven years for legal persons. This period is compulsory for the landlord, who can only interrupt the system of extensions of this term in case of necessity specified in that provision. Mediation with respect to the assured tenancy, as it is an imperative rule, will only be possible in the case of an exception to the minimum term. The Art. 10 Spanish Regulation on Housing Lease provides for the possibility of extending the term three years. Regarding contract extension, civil mediation is possible to renegotiate certain contract terms, such as the rent increase.

The Art. 8 Spanish Regulation on Housing Lease regulates contract subjective modification, such as assignment or subrogation. The tenant, considering the necessary permission of the landlord, can assign partially the home and, if the assignment is total, is a case of subrogation, provided for in Spanish Regulation on Housing Lease for different cases: the subrogation for death of the tenant, provided for in Arts. 15 and 16; the subrogation by the spouse of the tenant, in accordance with

Art. 12.2; and the subrogation for separation, divorce or nullity of the tenant, in accordance with Art. 15. In this regard, civil mediation can facilitate the agreement between the parties, especially in the case of subrogation, because the new tenant must comply with contract terms and can ensure that the landlord does not block the subrogation.

The right of withdrawal of the tenant is regulated in Art. 11 Spanish Regulation on Housing Lease. The tenant must remain in the dwelling for a minimum of six months to withdraw from the contract or pay the equivalent of six months' rent. In this regard, civil mediation is the mechanism to facilitate communication between the parties, and even as a preventive mechanism for tenancy abuses, such as charging more monthly payments than those corresponding to the six months. The regulation of the rent is provided for in Arts. 17–20 Spanish Regulation on Housing Lease. The main dispute regarding mediation is the rent increase, in which case the mediator must advice the landlord to respect the legal limits for increasing, because the rent increase can be used as a mechanism to force eviction.

The tenancy deposit is provided for in Art. 36.1 Spanish Regulation on Housing Lease. At the end of the lease term, if there has been no damage to the property and no unpaid rent, the landlord must return the deposit to the tenant. In the case of a residential tenancy, this mandatory deposit is limited to one month's rent and must be paid in cash. Regarding the mandatory legal regime of the tenancy deposit, civil mediation is reserved for its return, when disputes may arise, due to the lack of return or its unilateral reduction by the landlord. This will occur especially in the Spanish regions that have not provided for the compulsory deposit of the tenancy deposit.

The landlord must develop maintenance work on the dwelling, which are those repairs necessary for housing conditions. These repairs do not allow for a rent increase, as established in Art. 21 Spanish Regulation on Housing Lease. The tenant is obliged to bear such works, with the right to reduce the rent proportionally, if the works last more than 20 days, according to Art. 21 Spanish Regulation on Housing Lease. If the works make the dwelling uninhabitable, the tenant may suspend the contract or withdraw from it, according to Art. 26. Civil mediation in the field of housing repairs is necessary for conflicts arising from the execution of these works, or in the proportion of the rent reduction, considering the tenant tolerance on these repairs. The landlord should specify the rent reduction and the available part of the dwelling, considering tenant housing needs.

Regarding improvement works, the tenant must bear if them cannot be deferred until contract termination, as provided for in Art. 22 Spanish Regulation on Housing Lease. The landlord can increase the rent for improvement works, once the minimum term has expired, as provided for in Art. 19 Spanish Regulation on Housing Lease. On the other hand, adaptation works in the tenant's dwelling require the express consent of the landlord, according to Art. 23. In case the tenant is a person with disabilities, these works can be developed by notifying to the landlord, according to Art. 24. Civil mediation facilitates tenancy agreement in this field, and that the landlord accept adaptation works for person with disabilities.

Arts. 27 and 28 Spanish Regulation on Housing Lease refer to the termination for breach of contract and the extinction of housing lease. Civil mediation in this field should be reserved for the verification of the breach of contract and of causes for

extinction, the assessment of the correct return of the property possession, and the return of the corresponding tenancy deposit.

2.1.3. Civil mediation in housing foreclosure in condominiums

Arts. 681–698 Spanish Civil Procedure Act regulate the enforcement of housing foreclosure, which are privileged and preferential. The conflicts susceptible to mediation in this field refer to the foreclosure of mortgage credits, whose main consequence is the eviction. The advantage of civil mediation in housing foreclosure in condominiums is that it provides a solution to neighbourhood conflicts that may arise from eviction.

Regarding out-of-court mediation in housing foreclosure, the Decree-Law 6/2012, of 9 March, on urgent measures for the protection of mortgagors (BOE 10 March 2012) has incorporated legal instruments when foreclosure affects the mortgagor's main residence (Blanco, 2017; Pérez, 2018), when the banking creditor adheres to the Code of Good Practices provided for in this Decree-Law. The Code of Good Practices includes three phases of action. The first phase ensures the viable restructuring of mortgage debt, through term extensions or interest rate reduction. The second phase aims, if the previous restructuring fails, to reduce the debt. Finally, if neither of the two previous measures succeeds in reducing the debtors' mortgage effort to limits that are acceptable for their financial viability, they may request, and the banking creditors must accept, payment in kind. In the latter case, the former debtor will be able to inhabit the dwelling for a period of two years in affordable housing lease. Likewise, the default interest rates applicable to mortgage loan contracts are moderated.

According to the Spanish legal regime on mortgage foreclosure (Gil, 2013), civil mediation in this area must involve the agreement of the banking creditor, to suspend the mortgage foreclosure process (Adán, 2017; Valiño, 2018). Consequently, it is appropriate to do a co-mediation in this field, such as a negotiation assisted by a professional, as in the Mortgage Intermediation Offices created in Catalonia.

Different agreements can be reached through out-of-court mediation in housing foreclosure (Adán, 2017). Firstly, the conversion of the mortgage loan into a housing lease, to avoid eviction and provide for a housing solution, according to the Code of Good Practices. It is also possible to agree on payment in kind, which is also provided for in the Code of Good Practices.

On the other hand, there are different alternatives in civil mediation to execute the mortgage loan (Adán, 2017). First, considering a term extension of the loan, for a certain period, to promote the debtor's compliance. Moreover, an increase in the repayment period can also be agreed, considering a modification of the interest rate. However, the Code of Good Practices allows for a moderation of the default interest rates applicable to mortgage loan contracts. Finally, it is possible a debt reduction through civil mediation and even agree on a payment in kind.

2.2. Neighbourhood conflicts in condominiums: Economic and regulatory disputes

Condominiums refer to the legal treatment of the division and organisation of private properties, and a co-owned community property, because of the legal segregation of a common building. Consequently, there are private properties, such as

dwellings, and a community property on common elements co-owned by the various individual owners. Art. 6.3 Spanish Civil Mediation Act provides for the voluntary nature of civil mediation in the field of condominiums, so that no one is obliged to engage in mediation or to conclude a mediation agreement. In this sense, it is advisable to include in Condominium Statute an agreement to submit to mediation any dispute or neighbourhood conflict, as a prior step before the jurisdiction, as permitted by Art. 6.2 Spanish Condominium Act.

The mediatable disputes must refer to available rights of the parties in condominiums, without judicial approval, according to Art. 2 Spanish Civil Mediation Act, to reach transactional agreements provided for in Art. 751 Spanish Civil Procedure Act (Guerra, 2016), under the limits stablished in Art. 1255 Spanish Civil Code, referred to the rule of law, morality, and public order. The subjects of conflicts in condominiums could be several owners regarding co-owned elements, or neighbourhood or personal conflicts without affecting condominium elements. The latter case refers to conflicts arising because of rights referred to the ownership of private elements, which are not regulated in the Spanish Condominium Act, such as a damp that has arisen in another dwelling, derived from the use of the dwelling itself.

Likewise, neighbourhood conflicts can also arise in the proper sense, considering personal conflicts without affecting the condominium elements. These may be of a financial nature, arising from the non-payment of community fees. In this case, civil mediation should be aimed at orienting the owners to comply with the general expenses for the correct support of the running costs of the condominium and its maintenance (Gil, 2013), as well as its facilities, charges and responsibilities as required by Art. 9 Spanish Condominium Act. Consequently, the civil mediation agreement can be concluded with a settlement agreement and a payment schedule according to the debtor. However, the dispute can also arise from the enforcement or interpretation of the rules, such as cohabitation, as in the case of general rules on the use and maintenance of common areas or private elements. The owner is not allowed to develop private activities that affect the condominium, because the lack of permission regarding certain economic activities, or because of causing emissions or nuisances to the rest of the owners.

Finally, other neighbourhood conflicts may arise from the adoption of condominium agreements. These are conflicts relating to the majorities legally required to allow certain activities in the co-owned elements. In this sense, Art. 17 Spanish Condominium Act has eliminated unanimity in decision-making, to facilitate understanding between owners. Thus, a majority of one third of the owners, representing one third of the condominium shares, is required for agreements involving the installation of new telecommunication infrastructures or the use of energies. On the other hand, a simple majority of owners and shares is required for cases in which architectural barriers are to be removed, even in the case of modification of the Condominium Statute. Finally, a qualified majority of three-fifths representing three-fifths of the community shares is established for moving of a porter's lodge, regardless of whether this involves the modification of Condominium Statute.

2.3. Comparative law in conflicts in condominiums: The cases of us and Canada

The Comparative Law perspective of EU, USA, and Canada, about their provisions on conflicts in condominiums, is useful for the improvement of civil mediation in this area. Therefore, the paper examines the provisions in detail, those referred to Hawaii, Florida, New York, and in other States such as Canada.

Regarding US Law, in Hawaii, Art. 514B-161 of the Hawaii Revised Statutes provides that civil mediation in conflicts in condominiums is for an owner or co-owners of the condominium, to solve an interpretation or enforcement of the Condominium Statute provisions. In this case, the mediator's role is to assist the parties in reaching a mediation agreement, in particular the evaluation, as a tool for mediators on Hawaiian condominium law and case law. The Hawaii Revised Statutes also establishes that the fee for the first hour corresponds to $375 to each of the parties. The rest of the mediation expenses are funded by the Condominium Education Trust Fund, which can assume up to the amount of $3,000, unless the mediator indicates that the parties want additional mediation time. In Florida, Section 718.112(2)(k) Florida Statutes of the Condominium Act, amended in 2021 by Section 718.1255, requires a Condominium Statute term on mediation or arbitration for dispute resolution. Mediation in condominiums must be before the jurisdiction and held either at a Condominium Association or at the condominium itself. The Condominium President may require an owner to do or not to do an action, to make an alteration to the co-owned elements, to promote condominium elections, to conduct actions, to hold meetings, or to inspect the internal regime. A choice between mediation or arbitration may be made by an owner or the condominium as a whole, in accordance with Section 718.1255(5), considering the language of the documents, the time involved, which is longer in arbitration, the expenses, which are also higher in arbitration, and the nature of the dispute. Finally, the Association of the Bar of the City of New York offers a Low-Cost Legal Services, so-called Co-op and Condo Mediation, which consists of the resolution of neighbourhood disputes. The mediation costs are lower than those of the jurisdiction, and consist of $100 for each of the parties, and the mediator's fees, which cannot exceed $600.

In Canada, under Section 132 of the Canadian Condominium Act, an agreement to submit conflicts in condominiums to arbitration or mediation may be made between the co-owners of the condominium, or between two individual owners. Agreements subject to mediation or arbitration are those relating to disagreements on budget statement and disagreements between corporation and owners, for those stablish certain provisions on civil liability and fees.

3. Practical challenges and findings of blockchain technology in condominiums: The self-execution of mediation agreement and housing management

Lastly, this paper proposes several findings for housing mediation and management in condominiums, such as Condominium Statute in blockchain, self-execution of Civil Mediation agreement, data protection, and Tokenization and

Internet of Things, based on the significance of blockchain technology in this regard. The implementation of blockchain technology into Property Law is challenging, considering the hard regulation on condominiums in Civil Law countries. To this purpose, this section provides for several legal remedies to adapt the rules explained above to the blockchain-based mediation. In this regard, it is important to mention that objective elements regarding mediation could be self-executed through blockchain technology, such as telematic attendance or voting systems, because of its immutability, and subjective elements, such as the breach of mediation agreement, may need human intervention in case of inadequate outcomes of programming.

3.1. Condominium statute in blockchain technology: Telematic attendance and voting systems

The main instrument available to deal with neighbourhood disputes is the Condominium Statute, as a preventive mediation instrument. However, its main disadvantage is the interpretation of the Condominium Statute and, for this case, is more appropriate to do a mediation procedure. The condominium mediation procedure needs an external and neutral mediator, such as the condominium administrator or a third party. This neutrality aims to modify the approach in the mediation, and to establish different rules and collaboration regarding the co-owners. To develop mediation in a condominium, it is advisable for the mediator to do the following actions. Firstly, to invite the president of the condominium and the secretary of the condominium, even if the secretary does not perform managerial functions. Secondly, to meet individually with the co-owners, to know the origin of their personal conflicts in the condominium. Thirdly, to meet with each of the tenants. Finally, to meet with the former presidents or secretaries of the condominium, as well as the first co-owners, to get an overview of the conflict. Regarding the registration of the Condominium Statute, it is publicised in the Spanish Land Registry, as well as all its modifications, in order to guarantee its effectiveness, which is very useful as a preventive instrument for conflicts in the condominium.

The Condominium Statute can be automated using blockchain technology, in a similar way to Family Business Protocols or smart contracts. Firstly, the Condominium Statute contains the agreements relating to the use of the condominium, the shares, and their modification. These include the provisions relating to their transfer, the constitution of a usufruct for the widowed spouse over the private ownership, the exclusion and separation of co-owners, the budgets of the condominium, the provision for submitting future disputes to mediation, and the succession as president or secretary of the condominium in the event of death. Secondly, the majorities required for the adoption of resolutions could be also determined, in accordance with the Spanish Condominiums Act. Thirdly, it is possible to self-regulate the structure and functioning of the condominium with internal rules on the common elements. In this sense, the possible formalisation of a Corporate Compliance of the condominium (Torres Ferradás, 2018), as a code of good practices of this condominium regarding third parties, could be useful. Fourthly, could be also useful to establish the composition, structure, and operation of the condominium's operating bodies, in accordance with the Spanish Condominiums Act. Fifthly,

Condominium Statute could specify the creation of an internal dispute board, and the establishment of the criteria for composition and operation, as a mechanism prior to civil mediation. Sixthly, it is possible to set the rules regulating the incorporation of co-owners and tenants regarding the use of common elements. Seventhly, Condominium Statute could regulate the economic relations between the condominium and each co-owner, as well as the budgets.

The effectiveness of the mediation agreement in the condominium is different depending on the origin of the mediation agreement (Pérez Giménez, 2010), regarding a mediation procedure (Barruetabeña, 2015), or the submission of the agreements to the Condominium Statute provisions. The agreements with internal legal effectiveness refer to those which are not registrable in the Spanish Land Registry because they do not imply a modification of the Condominium Statute. The mediation agreements on the Condominium Statute can access to the Land Registry because the modification of the condominium shares or the amendment of their terms. Finally, mediation agreements regarding ethical values of the condominium, as in a Corporate Compliance, and regarding internals rules on the succession or the president or secretary in the event of death are only enforceable in the condominium.

Depending on the blockchain technology platforms and their possibilities, it is possible to distinguish between two types of Condominium Statute. On the one hand, one in which the parties agree or personalize it through Ethereum, in the form of a preventive mediation on the Condominium Statute provisions, or in the form of a modification of the Condominium Statute as part of the mediation agreement. Due to the existence of the Condominium Statute off-chain, blockchain technology is used to guarantee the effectiveness of its terms, as well as the activation and deactivation of its encoding.

3.2. Self-execution of civil mediation agreements in conflicts in condominiums: Towards a blockchain mediation in neighbourhood conflicts

Civil mediation can also be used once the neighbourhood conflict has arisen, because the Condominium Statute does not provide for mediation, neither exist in blockchain to self-execute private remedies, nor because any mediation has been developed prior to the conflict. The mediator's intervention in personal conflicts or neighbourhood conflicts in a condominium focuses on managing the dispute or on taking advantage of this event to discuss on the condominium with the various co-owners, with the aim of modifying the Condominium Statute to prevent disputes and to submit it to future mediations, as in Protocols in family business (Alonso Dal Monte, 2012).

Civil mediation in conflicts in condominiums should be developed in different phases (Reyero, 2012), so that it is progressive and adequate to achieve the mediation agreement, which is the final objective of any mediation, as well as the modification of the Condominium Statute to self-regulate future conflicts. In the first phase, each problem is defined, and each co-owner perspective is summarised to get the mediator the whole view, using open questions and rephrasing. In the second phase, the objectives that each co-owner has, and the contributions that are willing to make to

solve the problem, are explored using open-ended questions (Martín Nájera, 2009). In the third phase, the aim is to destabilise the stories and construct an alternative story by legitimising the needs, intentions, and reasons of each co-owner with a refocus, rephrasing and circular questions. Finally, in the fourth phase, the search for a mediation agreement proceeds through circular questions.

In this sense, an adequate design of mediation process in conflicts in condominiums should be based on the following actions. Firstly, the contact to co-owners by means of an informative session for the parties to the mediation process. Secondly, the choice of an appropriate the mediation space, which should take place in the mediators' offices, as a neutral space, so that the condominium is inadequate because the conflict may refer to its management. Thirdly, the mediation and choice of mediators, an area in which, due to the idiosyncrasy of condominiums and the large number of co-owners, the choice of two mediators is appropriate. Fourthly, the analysis of the mediator's communication, considering neighbourhood conflicts. Fifthly, the analysis of the co-owners' alliances based on their personal relationships, to identify the parties in conflict. Sixthly, the mediation agreement and, if necessary, the modification of the Condominium Statute.

3.3. Regulatory challenges on civil mediation: GDPR in blockchain technology for mediation agreements in condominiums

Civil mediation in condominiums using blockchain technology needs the GDPR to guarantee the protection of the parties in the mediation agreement, in several manners. On the one hand, through the correct processing of personal data under Art. 22 GDPR, which allows for its protection against automated processing. Art. 22 GDPR prohibits the automatic processing of data, except in three cases (Finck, 2019), referred to in paragraph 2: That the decision is necessary for the conclusion, in this case, of the mediation agreement; that it is authorised by Union or Member State law, providing for appropriate measures; or that it is based on the explicit consent. Likewise, paragraph 3 of the provision refers that adequate data protection measures must be implemented, including at least the possibility of solving problems resulting from automatic data processing, in the interests of transparent and fair processing. Regarding the measures to be adopted, it is necessary to establish in the Condominium Statute the actions to be taken to guarantee data protection, as a form of Corporate Compliance (Fries, 2018). However, the last cause relating to consent has disadvantages, due to a lack of specificity, because the transfer of data needs the informed consent on its processing. The automation of the mediation agreement in the condominium prevents the third requirement from becoming effective in practice, because there is no possibility of revoking consent.

In accordance with the data protection of Art. 22 GDPR, which excludes from such protection the massive processing of data whose user has expressly consented, this rule does not adequately resolve the inadequate results caused by automated decision-making by means of algorithms, such as the voting system or the telematic attendance in a condominium. Collective protection of data privacy is crucial, as well as rules that rebalance its asymmetry, through the duty of information (Art. 4.2 93/13 Directive, §247 Einführungsgesetz zum Bürgerlichen Gesetzbuche, Art. L312-2 to 6

Code de la consommation, and Art. 120 septies Decreto legislativo 1° settembre 1993, n. 385 Testo unico delle leggi in materia bancaria e creditizia), and that address algorithmic governance legally (European Group on Ethics in Science and New Technologies, 2018; Helm, 2016; Martini, 2020), and not only ethically. This should consist of preventive, self-compositive mechanisms, such as mediation in condominiums, and self-regulatory mechanisms, such as the incorporation of blockchain technology into the Condominium Statute.

Regarding the GDPR and its compliance in the mediation agreement in condominiums using blockchain technology, it is essential to comply with the obligation to justify decisions based on algorithms, including machine learning (Watcher, 2018), according to Arts. 13 to 15, to guarantee the right of access to data and the right to information on their processing contained in Art. 15 GDPR and, finally, to address the impact of the processing of such data and access to information provided for in article 35 GDPR. In this sense, there are academics who have proposed de lege ferenda several measures (Martini, 2020). Firstly, the extension of data protection requirements, in this case to the co-owners of the condominium. Secondly, the audit of the processing of personal data, which can be done by the administrator of the condominium or a third party, as well as the provision of information on the processing of personal data. Thirdly, the extension of the duty of information regarding procedures and software applications that may have an impact on the rights of users, in this case co-owners regarding the use of blockchain in condominiums, in accordance with Art. 22 GDPR. Finally, the obligation to provide adequate information on data protection. In this regard, Art. 25 GDPR provides for the requirements for data privacy by design and data privacy by default. Data privacy by design is referred to technical measures to ensure personal data security and privacy, in this case through blockchain technology, which implies pseudonymization and data minimization of the co-owners. Data privacy by default is referred to collect, store or process personal data and, according to Art. 42 GDPR, requires demonstrating privacy compliance top the co-owners through the administrator.

3.4. Practical solutions for condominium management: Tokenization and internet of things for property remote control in condominiums and P2P accommodation

The Tokenisation of a real estate property in a condominium generates a token in a smart contract, to give a value through the division of ownership and the partial allocation of tokens. This permanent control of the object and the exclusion of third parties materialise the smart property conceived by Szabo (Szabo, 1996). In addition, the token, as a representation of a real asset, in this case a dwelling, extends the blockchain technology to an object for its delivery. In real estate property tokenisation, tokens, as a digital asset, represent a right in rem regarding a real asset. The value of the token will correspond to the property value. The investor of a P2P real estate platform, in addition to holding a tradable token, can also convert it into a cryptocurrency that can be used indirectly as a payment method, such as cryptocurrencies in the Blockchain platform on PayPal.

Public and Private organisations create tokens to change their business model.

Tokenisation of goods allows property to be digitised, so that its management is programmable, enabling real-time mediated control through blockchain technology. Blockchain and Ethereum currently allow between three and six transactions per second, and Ethereum plans to increase to 1 million per second, which would facilitate the tokenisation of real estate. The main advantage of tokenisation is that it allows illiquid assets to be transformed into instruments for funding to the real estate market, such as in mortgage securitisation. For example, P2P real estate crowdfunding platforms acquire properties and generate tokens transferable on the corresponding blockchain platform. The tokens are divisible and universal, so that if demand for them increases, the so-called illiquidity discount will be reduced.

In the tokenisation of both real state and movable property, it is essential that the token remains linked to the object of the real right, such as that the asset has a possessory correspondence with the real estate property. This verifies the existence of the elements of transmission and extinction. The tradition, in terms of Tokenisation, takes several forms: Firstly, by means of the representation of the property in the corresponding on-chain record, which would correspond to the traditio ficta; secondly, by oracle verification for a correct transfer of possession as real traditio; finally, the change of the possessory title on-chain can be carried out by means of the constitutum possessorium, according to Art. 1463 Spanish Civil Code and Spanish case law.

Other alternative options to the use of a third-party intermediary in a blockchain are the following: factory and harbor. The factory concept consists of introducing an intermediate layer between the P2P platform and potential consumers, whereby this layer acts as a third-party trustee. For its part, harbor introduces the intermediate layer in the form of a Regulated token, to verify the regulatory compliance of the corresponding transaction. The Regulated token is a protocol that checks the information of the investors who participate in the transaction and verifies their address and its approval.

Tokenisation poses two legal challenges for Civil Law (Savelyev, 2018), in relation to Contract Law, in the sense of incorporating a digital asset for the representation or control of a real asset and to manage the condominium and its dwellings. Firstly, the replacement of the legal treatment for contractual objects by the regulation of the token: in the form of a reputational mechanism, through the acceptance of the terms and conditions of the platform (Bygrave, 2015); or in the case of an open access model, in the form of a core team that centrally control and develop the platform (Phillips, 2009). Secondly, the determination of the legal nature of rights in rem derived from the tokens, in this case private ownership and co-ownership in a condominium. A token can exist as a credit right that binds the debtor, such as in collaborative hosting in condominiums; therefore, is a credit right because it is an activity issued and transferred based on the algorithms of the computer protocol, which is more appropriate because of its re-traceability and property remote control. In the latter case, there is a person bound because of the right represented by the token.

Therefore, it must be distinguished between the right to a token, as a digital asset, such as NFT or cryptocurrencies (Savelyev, 2018), and the rights certified by a token or Tokenization of goods, as a representation of a real asset, such as in condominium tokenization. So that, it is possible to differentiate between two legal relationships: the token owner regarding third parties, in this case co-owners in a condominium, and the

token owner and the token issuer, as in cryptocurrencies. The token has an issuer, which becomes a debtor regarding the token owner. The relationship between the issuer of the token and the owner is a credit right, but this does not mean that the token right is a right in rem regarding third parties.

Consequently, several issues are necessary in order to regulate tokens, as they are a right in rem and a credit right depending on their material scope of application: the control over the token; the alteration of the token by a hacker; protection regarding third-parties, if considered a right in rem; the type of possession of the token, which must be mediated; and, finally, the miners or third parties to validate the token selling. The solution that should be adopted in this respect is a legal treatment that offers the same guarantees regarding a non-tokenized object. Tokenisation allows remote control or the representation of a real asset and is therefore instrumental to the object to which it is digitally linked. So that, the legal treatment should be the same, including specific provisions for each type of contract, especially for those with effectiveness regarding the ownership of real assets.

The IoT integrates the object into a smart contract, a connection that provides for its remote control (Stark, 2016). The smart contract cannot adapt the encoding without an interconnection of its object through the IoT, to receive external events that affect contract execution. Moreover, the IoT can be used to prevent errors or fraud (Johnson, 2017), such as in the use of collaborative accommodation in a condominium, to permanently receive information on housing use and condominium use, as well as to measure external events using algorithms connected to Big Data.

There are several advantages to the application of IoT. On the one hand, the IoT facilitates contract execution apart from parties' agreement. On the other hand, the connection of the contractual object through the IoT prevent from breach of contract, because it is possible to self-execute private remedies, such as blocking the access to the dwelling in P2P accommodation. The use of IoT, as a product of tourism 4.0 (Rodríguez Bautista, 2018), transform it in P2P accommodation 4.0. One of the most common applications of collaborative accommodation 4.0 is the use of smart locks, programmable for specific days and unlimited keys to guarantee dwelling exclusion, such as access codes, as in the UK, or the programming of different codes for access to traditional keys, as in France. Other methods to access to P2P accommodation are facial recognition, as in home sharing, smart bracelets, and PIN codes or QR codes programmable from a mobile application. This application, connected to the IoT to the dwelling, would also allow the user to modify an incorrect lock. Similarly, regarding the movable assets of collaborative housing, it is possible to connect the dwelling to Internet for its remote management, such as with smart speakers, smart lighting, and even smart bracelets for programmable consumption. There are also applications, executable with tablets or smartphones, to personalise any element in the P2P accommodation, including a virtual assistant to contract external services. Finally, in some 4.0 hotels, it is possible to find smart robots or robots programmed to provide for services.

Regarding the latest doctrinal trends in Law and Technology, those indicated by European and North American civil academics (Busch, 2016; Reisman, 2018), it is possible to expect a growing role for blockchain technology, tokenisation and IoT, as well as AI and algorithms. Moreover, should be added the impact of augmented reality

and, therefore, its future legal framework. The application of augmented reality to property law raises several legal challenges: the representation of a digital world differentiated from the real world and its legal discordances; civil liability for damages caused in the digital world; security, privacy, protection of personal data and privacy regarding augmented reality and geolocation, as well as their effects on third parties; finally, the risks of monetisation of the digital world.

4. Conclusions

Civil mediation in conflicts in condominiums needs to provide for an adequate harmonization of the current regulation on civil mediation and on condominiums, in order to implement IT in this regard. The practical challenges are not only referred to regulatory amendments, but also to the proper implementation of blockchain technology in condominiums. To this purpose, the paper proposes the implementation of blockchain to the Condominium Statute, to the self-execution of housing management and mediation agreements, as well as to promote the tokenization in condominiums to facilitate the condominium management.

Conflict of interest: The author declares no conflict of interest.

References

Adán Doménech, F. (2017). Foreclosure mediation: Is it legal, is it valid, is it possible (Spanish)? In: Tomás Tomás, S., Castillo Felipe, R., García-Rostán Calvín, G., Sigüenza López, J. (editors). El proceso civil ante el reto de un nuevo panorama socioeconómico. Aranzadi. pp. 429–441.

Al-Bassam, M., Sonnino, A., Bano, S., et al. (2018). Chainspace: A Sharded Smart Contracts Platform. In: Proceedings 2018 Network and Distributed System Security Symposium. pp. 1–16.

Allam, Z. (2018). On Smart Contracts and Organisational Performance: A Review of Smart Contracts through the Blockchain Technology. Review of Economic and Business Studies, 11(2), 137–156. https://doi.org/10.1515/rebs-2018-0079

Alonso Dal Monte, C., Naranjo Hernández, M. J. (2012). Mediation in family businesses (Spanish). Revista de Mediación, 10, 34–41.

Barruetabeña Zenekorta, M. (2015). Mediation in the context of family protocols (Spanish). Diario La Ley, núm, 8479, 1–5.

Blanco García, A. I. (2017). The mortgage dispute: Mediation as a means of protection for mortgagors (Spanish). In: Blanco García, A. I. (editor). Tratado de Mediación, Tomo I: Mediación en asuntos civiles y mercantiles. Tirant lo Blanch. pp. 271–294.

Busch, C. (2016). Towards a "New Approach" in European Consumer Law: Standardisation and Co-Regulation in the Digital Single Market. Journal of European Consumer and Market Law, 5(5), 197–198.

Bygrave, L. (2015). Internet Governance by Contract. Oxford University Press.

European Group on Ethics in Science and New Technologies. (2018). Statement on Artificial Intelligence, Robotics and Autonomous Systems. European Commission. pp. 1–24.

Finck, M. (2019). Smart contracts as a form of solely automated processing under the GDPR. International Data Privacy Law, (9)2, 1–17.

Fries, M. (2018). Private Law Compliance through Smart Contracts? Compliance Elliance Journal, 1(4), 11–18.

Ganuza, J. J., Gómez Pomar, F. (2020), Instruments to intervene in contracts in times of COVID-19: A guide to their use (Spanish). InDret, 2, 558–584.

García Rubio, M. P. (2020), Regulatory measures in the area of contracts on the occasion of COVID-19 in Spain (Spanish).

Revista de Derecho Civil, 2(7), 15–46.

Gil Vallejo, B., Buch Borrell, A. M., Altés Calvo, T., García Roqueta, C. G. (2013). Scope of application of civil and commercial mediation (Spanish). In: Civil and commercial mediation. Dykinson. pp. 67–97.

Guerra Pérez, M. (2016). The mediation agreement in the communities of neighbors and horizontal property (Spanish). In Sánchez García, A., López Peláez, P. (editors). Tipología contractual de los mecanismos alternativos de solución de conflictos. Aranzadi. pp. 287–307.

Helm, P. (2016). Group Privacy in Times of Big Data. Digital Culture & Society, 2(2), 137–151.

Johnson, G. L. (2017). Planning the future: Blockchain Technology and the Insurance Industry. In-House Defense Quarterly, 73, 73–78.

Kemp, R. (2018). Legal Aspects of Artificial Intelligence (v2.0). Cyberspace Lawyer NL 2, 1(22), 1–48.

Larenz, K. (1963). Basis of the contract and fulfillment of the contract: the meaning of "changed circumstances" (German). C.H. Beck. pp. 10–201.

Martín Nájera, M. T., Pérez-Salazar Resano, M., Utrera Gutiérrez, J. L. (2009). Protocol for the implementation of intra-judicial family mediation in the courts and tribunals that hear family proceedings (Spanish). Revista de Mediación, 4, 12–35.

Martini, M. (2020). Regulating Algorithms. How to Demystify the Alchemy of Code. In: Ebers, M., Navas, S. (editors). Cambridge University Press. pp. 102–108.

O'Shields, R. (2017). Smart contracts. Legal agreements for the blockchain. North Carolina Banking Institute, 1(21), 177–194.

Ocariz, E. B. (2018). Blockchain y Smart contracts. In: La revolución de la confianza. RC Libros. pp. 111–112.

Parra Lucán, M. A. (2015). Unforeseeable risk and modification of contracts (Spanish). InDret, 4, 1–54.

Pérez Daudí, V. (2018). Mediation in the foreclosure process. In Alonso Salgado, C., Castillejo Manzanares, R. (editors). Nuevos debates en relación a la mediación penal, civil mercantil (Spanish). Servicio de Publicaciones e Intercambio Científico de la Universidade de Santiago de Compostela. pp. 229–249.

Pérez Giménez, M. T. (2010). Mediation within the framework of the family protocol (Spanish). Actualidad Civil, 9, 997–1019.

Phillips, D. E. (2009). The Software License Unveiled: how legislation by License Controls Software Access. Oxford University Press. pp. 147–173.

Reisman, D., Schultz, J., Crawford, K., Whittaker, M. (2018). Algorithmic impact assessments: A practical framework for public agency accountability. Available online: https://openresearch.amsterdam/image/2018/6/12/aiareport2018.pdf (accessed on 2 January 2024).

Reyero Serret, S., Gil Ballesteros, C. (2012). Mediation Case: Mediation in a Family Business (Spanish). Revista de Mediación, 10, 42–49.

Rodríguez Bautista, F. (2018). From hospitium to tourism 4.0 (Spanish). Libros.

Salvador Coderch, P. (2009). Alteration of circumstances in Art. 1213 of the Proposal for the Modernization of the Civil Code on Obligations and Contracts. InDret, 4, 1–60.

Savelyev, A. (2018). Some risks of tokenization and blockchainizaition of private law. Computer Law & Security Review, 34(4), 863–869. https://doi.org/10.1016/j.clsr.2018.05.010

Stark, J. (2016). Making sense of Blockchain Smart Contracts. Coindesk.

Szabo, N. (1996). Smart contracts: Building blocks for digital markets. Extropy: The Journal of Transhumanist Thought, 16.

Taleb, N. (2007). The Black Swan: The Impact of the Highly Improbable. Penguin Random House.

Torres Ferradás, A. M. (2018). Mediation Compliance Officer (MCO): A new figure in the company. In: Fariña, F. (editor). Construcción de paz a través de la mediación: Conocimientos y prácticas de una metodología. Conferencia Universitaria para el Estudio de la Mediación y el Conflicto (CUEMYC). pp. 414–418.

Valiño Ces, A. (2018). Intra-judicial mediation: referral to the mediation procedure and the importance of the briefing session (Spanish). In: Alonso Salgado, C., Castillejo Manzanares, R. (editors). Nuevos debates en relación a la mediación penal, civil y mercantil. Servicio de Publicaciones e Intercambio Científico de la Universidade de Santiago de Compostela. pp. 107–120.

Watcher, S., Mittelstadt, B., Russell, C. (2018). Counterfactual explanations Without Opening the Black Box: Automated Decisions and the GDPR. Harvard Journal of Law & Technology, 2(31), 841–887.