

BLOCKCHAIN APPLICATION IN GENERAL PRIVATE LAW: THE NOTARCHAIN CASE

ENRICO DAMIANI

SUMMARY: 1. The open (or pure) Blockchain. – 2. The permissioned (or closed) Blockchain. – 3. The Notarchain. – 4. Scopes of the Notarchain. – 5. Final evaluation.

1. *The open (or pure) Blockchain*

It was singled out¹ that the *Blockchain* is a technology able to keep, in a reliable way, a system of registers suited² to preserve an indelible and unmodifiable sign of given operations; limiting the analysis within the field of private law,³ a first aspect to analyse is the one related to the transfer operations without any interventions by a centralized authority that can relate to virtual currency or any other type of goods.

In the open (or pure) version the *Blockchain* does not show any access hindrance, there are no qualified fiducial issues and the final recipients of the subjective legal statuses directly have the cryptographic keys enabling to have the same legal statuses available⁴ that can be: self-representative, as in the case of the *Bitcoins* existing inside the *Blockchain*, that is being representation of the existing physical proprieties outside the cryptographic representation (*off-chain*) which is in such a case a simple *token*, a kind of symbol representing the goods and which can circulate thanks to the *Blockchain*.

In the case of a *token* circulation the biggest problem⁵ to be faced is how to guarantee the correspondence between the physical good and the *token* itself. For

¹ U. Bechini, *Il notaio digitale. Dalla firma alla blockchain* (Giuffrè 2019), 152 ff.; B. Arruñada, 'Blockchain's struggle to deliver impersonal exchange' (2018) 19 *Minnesota Journal of Law, Science & Technology* 55. The reflections by T. W. Dornis, 'Artificial Creativity: Emergent Works and the Void in Current Copyright Doctrine' (2020) XXII *Yale Journal of Law & Technology* 1, are very interesting and possible to be shared.

² About the potentialities that the Blockchain could express within Civil Law see A. Borroni, 'Blockchain: Uses and Potential Value', in A. Borroni, *Legal perspective on blockchain theory, outcomes, and outlooks* (Edizioni Scientifiche Italiane 2019) 5.

³ The arrival of new technologies seems to have undeniable problems on the whole system of Private Law, both on companies and on fundamental rights and freedoms. See M. Giaccaglia, 'Considerazioni su Blockchain e smart contracts (oltre le criptovalute)' (2019) 35 *Contratto e impresa* 941; D. Di Sabato, 'Gli smart contracts: robot che gestiscono il rischio contrattuale', in G. Perlingieri and A. Fachechi (eds), *Ragionevolezza e proporzionalità nel diritto contemporaneo* (Edizioni Scientifiche Italiane 2017) 387 ff. For a more recent paper, see E. Caterini, *L'intelligenza artificiale "sostenibile" e il processo di socializzazione del diritto civile* (Edizioni Scientifiche Italiane 2020) 11 ff., 42 ff.

⁴ Bechini (n. 1) 153.

⁵ There are many problems linked to the use of new technologies. See V. Moscon, 'Tecnologie blockchain e gestione digitale del diritto d'autore e connessi' (2020) *Il diritto industriale* 137; M. Fink, *Blockchain regulation and governance in Europe* (Cambridge University Press 2018); G. Rinaldi, 'Smart contract: meccanizzazione del contratto nel paradigma della blockchain', in G. Alpa (ed.), *Diritto e intelligenza artificiale* (Pacini Editore 2020) 343 ff.

example, in the case of the transfer of a real estate, it often happens that this latter is apt to changes (a plot of land becomes a building, a one-storey structure is raised to two etcetera). We are not facing unchanging entities like the *Bitcoin* so it should be necessary to think up a method enabling either to modify the *Tokens* or to give some more in addition.

The problem linked to the risk of losing the cryptographic key corresponding to a given legal status is of a no less importance. In such a case there would be the loss of the juridical control and the availability of the status itself.⁶

But also with reference to the legal statuses called self-representative as in the case of the *Bitcoins* there are some relevant problems coming to light: for example the anonymity enables the execution of huge patrimonial transfers with no possibility of identifying the subjects of the relationship with an evident risk of the possibility of performing criminal operations. In addition, the impossibility to identify the users in the open *Blockchain* makes the refund type remedies almost impossible to be performed as it is said that it “lives in a legally void space”.⁷

Even disregarding intents of a criminal kind, it is undeniable the use of the *Bitcoins* that could be made by someone who would like to avoid the aggression of the Revenue Office, or of his creditors, or of a spouse who is the beneficiary of an alimony cheque etc. Whether even the real estates could be transferred through a pure *Blockchain* one could imagine an equally dangerous use of such a technology in order to satisfy individual and egotistic questionable interests.

2. *The permissioned (or closed) Blockchain*

Instead of the open *Blockchain* showing the above-mentioned critical conditions, the creation of a *permissioned Blockchain* (or closed) is possible by a group of people according to the conventionally chosen rules related for example to the singling out of the involved operators, the way to insert data, the settling of possible disputes, etcetera, which is basically immune from the risks of the first one.

The operators can make use of technical precautions aimed at avoiding that the digital data, necessary for the *Blockchain* management, can be lost and are able to activate some mechanisms suited to eliminate negative economic effects arising from the failed correct functioning of the system,⁸ also through entering insurance contracts.

In a closed *Blockchain* the involved people are identified and the operations they carry out will be perfectly tracked; the related data will be legally binding due to the initial convention and all the operations will be subject to the private international legal system. Notwithstanding this, recurring to such a technology will always be a convenient operation, for example for the costs linked to need of maintaining more knots and therefore more computers, interconnected among them, through a demanding economic investment in comparison for example to a centralised database.

⁶ Bechini (n. 1), 155, who, to state the seriousness of such a possibility, recalls the American saying “Grandma picks a bad password and loses her house” quoted by J. Kaufman Winn, “The Hedgehog And The Fox: Distinguishing Public and Private Sector Approaches to Managing Risk for Internet Transactions’ (1999) 51 *Administrative Law Review* 955.

⁷ Bechini (n. 1), 158.

⁸ *Ibid.*, 161.

Resorting to the Blockchain has also been suggested to replace the already existing centralised systems.⁹

Think about the Blockchain for real estate adverts: some particularly qualified subjects, called *Gatekeepers*, would have the task of checking the transfer deeds, eventually filing them in a *ledger*.

Arruñada investigated the value the blockchain can add to the transfer processes in the real rights of real estates, exploring its potential and stigmatising the main difficulties that should be faced. He states that, contrarily to common statements proclaiming the end of mediators and the involvement of the States, the possible application of the blockchain in such a sector will have to make use of some specialists including public officials, especially for real estate transactions.

3. *The Notarchain*

Notarchain is a project aimed at the creation of a new platform that uses blockchain technology through the implementation of a series of proven open source technology protocols that will consent the transfers of goods and rights, their registration and archiving, in an easy way, quickly, safely and without high costs.

It has been possible to design the “Notarchain” project after the issue of Law Decree No. 135 of 14 December 2018¹⁰ stating the urgent provisions about the support and the simplification for the companies and the public administration (the so-called “simplification decree”).

The simplification decree introduces the definition of DLT: *distributed ledger technologies* in the set of rules, defining what the *smart contracts* are and foreseeing, if some requirements are met, that the same ones are compared to written contracts; finally it compares to the time stamp foreseen by the eIDAS Regulation (*electronic IDentification Authentication and Signature*)¹¹ on the electronic identification the *timestamp* on the DLT meeting the requirements identified by the Agency for Digital Italy (Agenzia per l'Italia digitale (AgID)).

Those provisions realise an official link between the legal system and the distributed ledger technologies (DLT) enabling this way the resort to the Blockchain functions.

The simplification decree foresees an equivalence between the *time stamp* of the blockchain to the time stamp in order to create a juridical certainty about the stamp applied to the digital document.

Some political parties stated it is a “notarization” phenomenon on a large scale, but such a reference seems rather wrong.

First of all, it is not correct to talk about “*notarization*” as the application of the *time stamp* is not certainly such and also because such a technique of time validation has been existing for long in our legal system. The idea that through the blockchain

⁹ Ibid.

¹⁰ Decreto-legge 14 dicembre 2018, n. 135, Disposizioni urgenti in materia di sostegno e semplificazione per le imprese e per la pubblica amministrazione, in *Gazzetta Ufficiale della Repubblica Italiana* No. 290, 14 December 2018.

¹¹ Regulation (EU) No. 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC.

one can get juridically equivalent results to those obtained through the resort to the Notary registration is wrong. The concept of “*notarization*” applied to the *blockchain* expresses the idea of providing a certain date and to make some information unmodifiable.

No true notarization is currently feasible through the blockchain both for the regulation context created through the simplification decree and because the compatibility between the Notary activity and the features connected to the blockchain is totally uncertain. The blockchain represents a system of information registration that is decentralised and with no intermediation, while the Notary activity is the expression of the centralization of the public function being the public officer the subject appointed to ascribe public trust to a document.

Notaries have immediately shown their interest for the “*distributed ledger technologies*” (DLT) keeping the distance from the so-called permissionless blockchain (*pure*, therefore distributed on many knots with no hierarchy).

Notarchain is a project by the National Board of the Notaries launched in 2017 and it foresees a *permissioned*, closed structure where the validation is reserved to a restricted core group of knots particularly qualified. The goal of the project is to guarantee safety in transactions, in partnership with IBM, is that of answering to the needs of digitalisation of the State and to guarantee the safety of transactions

Three relevant aspects¹² concerning *Notarchain* have been singled out: first of all the information will be handled not by anonymous subjects but directly by Notaries; the used platform will enable swiftness in acquiring information and keeping the registers, without any costs for the citizens, with the possibility of storing data at a world level, without the related difficulties linked to a decentralised data collection; finally safety will be highly implemented through the impossibility to modify the data, the previous check of the identity of the subject involved and the “correctness and completeness of the same data inserted in the chain”.

Being basically a digital base of storing and managing files, it will be possible to extend its use to different applications.¹³

4. *Scopes of the Notarchain*

An example of application of the Notarchain¹⁴ is the creation of a Public Register aimed at making the deeds for the appointment of Guardians known: the platform designed by Notartel S.p.A., a company of the National Register of Notaries and the National Fund of the Notaries providing IT services to Italian Notaries, guaranteeing them the access in real time, and on which it will be possible to insert the essential

¹² G. Gatti, *Notarchain, la blockchain dei notai* <<https://www.giuseppegatti.it/notarchain-la-blockchain-dei-notai.html>>.

¹³ S. Amadori, *Arriva Notarchain: la Blockchain tutta italiana* (18 November 2017) Blockchain4Innovation <<https://www.blockchain4innovation.it/mercati/legal/smart-contract/arriva-notarchain-la-blockchain-tutta-italiana>>.

¹⁴ The examples of application of the Notarchain were assumed by G. Marcoz, *Notarchain* <<http://www.gestitec.polimi.it/it/risorse/file-pubblici/propotech-monitor-italia-novembre-2018/notarchain>> and by E. Signori, ‘Notaio e Blockchain’, in G. Alpa (ed.), *Diritto e intelligenza artificiale* (Pacini Editore 2020), 401 ff. About the possible uses of the blockchain in business law, see the recent contribution by N. De Luca, ‘Documentazione crittografica e circolazione della ricchezza assente’ (2020) *Rivista di diritto civile* 101.

data of the deed of the appointment of guardians. The content of the register can be singled out and shared by Notaries and by other qualified subjects, like local health authorities. Such a system can be used also for the registers of proxies, of oleographic wills, of advance directives for the treatment and will about the donation of organs.

Another project that is under development is the compiling a unique register of the professions based on the blockchain (AUP is the Italian acronym), thought to uniform the different database existing today. Such a Register would enable the realisation of an integrated system suited to make it possible to share qualified information, as the role of someone registered in a Roll, guaranteeing full autonomy to the Rolls the subjects belong to for the management of the information ascribed to them.

The way for consultation is standardized and it can be used by telematic IT applications and the system enables the ongoing update of the role/qualification of each registered professional.

The Register is made up naturally by as many knots as the bodies entitled for the issue of the registrations and the license to practice to the Professional Rolls; they are the only entitled subjects for keeping the archive while those that are involved in the consultation of the Rolls can register to the net, simply having the permission of reading the data searched for.

Another project called “COMMODITIES OF THE PUBLIC SALES DEED” foresees the involvement of the Notaries, of the Public Bodies and of the operators of the sector like the real estate agencies and the managing agents and it is aimed at enabling the automatic transition of information linked to notary deeds (registered residence, bills of the utilities, taxes on the garbage disposal, the estate charges, the ones for the condominium, etc.) in order to enable the creation of a more effective and faster system of disintermediation of the information.

One of the projects that is being studied is the one called “MONNALISA” where the Notaries, the technological partner and the Cultural Heritage Ministry are involved. The core matter of such a project is making virtual and certifying any single work of art and the creation of a certified system for transferring the works of art.¹⁵

The objective is the one creating a safe system, clear, official of assignment of valuable moveable properties. A system based on the Blockchain technique can enable the access to every artist by registering his/her works and therefore the rights on his/her creations, obtaining that way a digital sealing of the data inserted that cannot be altered afterwards¹⁶. Such a register could be used either by auction houses or by the single collectors to know the legitimate origin of a work of art, the previous transference of the same one with the related quotation and so on.

The Law Decree No. 109 of 28 September 2018¹⁷ foresaw in clause 14, para. 4, that the Ministry of Cultural Heritage had an extraordinary national plan for monitoring and preserving the real estate belonging to the cultural heritage, fixing the criteria for their singling out also to submit them to interventions for their conservation, establishing the instrumental control systems to be used for the monitoring activities¹⁸.

¹⁵ Giaccaglia (n. 3), 966-967.

¹⁶ Ibid., 967.

¹⁷ Decreto-legge 28 settembre 2018, n. 109, Disposizioni urgenti per la città di Genova, la sicurezza della rete nazionale delle infrastrutture e dei trasporti, gli eventi sismici del 2016 e 2017, il lavoro e le altre emergenze, in *Gazzetta Ufficiale della Repubblica Italiana* No. 226, 28 September 2018.

¹⁸ Giaccaglia (n. 3), 964.

It is possible to imagine that the mapping of the estates under the historic and artistic interest can happen thanks to a digitalised system inserted in a *blockchain*.

Another project that is worth considering is the one called “BITCOINA”, which involves the Notaries, DEVO lab by SDA Bocconi and a technological partner having the realisation of a platform as its goal, which could supply the “notaries” with controls in case of transference of virtual currency in order to give life to a safe and clear system for the virtual currency transactions.

With the crypto currencies¹⁹, regardless the safety features implicit in the same blockchain technology, there are often cases of theft, loss or involuntary cession involving the storing and transference systems and the sales platforms.

In these cases, if the password used by the user to manage and validate the operations gets lost, the user can no longer sign the transaction unless the service is developed in multisig, for which the signature of a third validating subject is necessary, and this can be the Notary indeed in order to ensure safety, avoiding thefts and guaranteeing the real will of the parties in the transference.

Another fundamental problem concerns the identity of the user²⁰, that being represented only by an alphanumeric code ensuring anonymity, is openly in contrast against the current anti-money laundering legislation. The Notaries could be the grantors of the identity of those operating on the public blockchain.

A further field where the role of the Notaries could be used is made up of escrow²¹ services to execute completely the *smart contracts*.

The *escrow agreement* is a popular contract in the *common law* systems that is spreading also in our set of rules through which the parties entrust a third subject by means of a proxy to manage a cession of movable and immovable properties, including the assignment of shares and the companies or their branches. Following the entering of the *escrow account* agreement, the contracting parties entrust the third party with the propriety or the document that is the core matter of the economic operation and its countervalue in money. The entrusted propriety and the amount filed are managed on behalf of the entrusting parties until a given condition set forth by the parties takes places to be finally entrusted to the one entitled.

A third party that might be a Notary, therefore acts as an *escrow agent* among the contracting parties.

There are several useful points for resorting to such an institution: the amounts merging in the deposit are no longer available for the depositor and they can be enforced against the creditors, even in case of bankruptcy of the grantor; the creation

¹⁹ G. Gatti, *Dalla blockchain, la notarchain per la validazione di contratti* <<https://scienzamagia.eu/world-wide-web/dalla-blockchain-la-notarchain-per-la-validazione-di-contratti>>; Signori (n. 14), 410, correctly notices how the intervention of the Notary in the role of controller and manager of the signatures for the use and the exchange of cryptocurrency through “multisig” services is beneficial, everything by subordinating any operation to the use of the digital signature to make the transactions safer and clearer.

²⁰ About the topic of digital identity see: G. Alpa, ‘L’identità digitale e la tutela della persona. Spunti di riflessione’ (2017) *Contratto e impresa* 723; G. Resta, ‘Identità personale e identità digitale’ (2007) *Il Diritto dell’Informazione e dell’Informatica* 511; A. L. Tarasco and M. Giaccaglia, ‘Facebook è gratis? “Mercato” dei dati personali e giudice amministrativo’ (2020) *Il Diritto dell’economia* 270; Signori (n. 14), 410.

²¹ G. Quatraro and R. Israel, *L’escrow agreement e il ruolo del notaio* <<https://www.federnotizie.it/escrow-agreement-e-il-ruolo-del-notaio>>.

of an *escrow account* can represent a guarantee for importing companies and such a technique is finally much appreciated by banks and insurance companies to issue guarantees to the companies.

5. Final evaluation

As we have to summarise this short research aimed at highlighting the possible interactions between the blockchain and the Notaries, inverting what is the usual approach of a survey, it is now suitable to develop some general reflections.

The history of technology is strictly linked to the history of contracts²². In the dissertation for his Degree then published in the journal *Il Filangieri* in 1901²³, Antonio Cicu faced the topic of the importance of robots in private law, in particular analysing all the problems linked to the signing of the contract through the help of mechanic devices and trying, successfully indeed, to systematically focus those particular cases within the general subject of the contract as it can be extracted from the Civil Code dated back in 1865.

Many of the hints and reflections of the interpretation of that time, in particular the German and the Italian ones²⁴, can be to a large extent reconsidered and deepened in order to verify their newness also with reference to the bracketing born after the technological innovation of the last ten years²⁵.

Part of the interpretations²⁶, with a particular reference to the case of finalising contractual operations through the use of new technologies, questioned the consequences that the lack of dialogue between the parties can create in the same singling out of the categories of the so-called exchanges without agreement, where the contract would come out from the combination of two juridical deeds, often due to *per facta concludentia*, without being able to amount to a true agreement in any way.

The development of cybernetics, that branch of the science determined to study and realise the study and the realisation of suitable devices and machines to simulate the functions of the human brain, self-regulating through signals of power and control either in electric circuits or in mechanic systems, determined the increase of the research concerning the so-called *software* agents that is those “smart” programmes able to perform the interaction with a given level of autonomy, spontaneous

²² Rinaldi (n. 5), 343, who recalled a concept eminently recalled by N. Irti, *Norme e luoghi. Problemi di geo-diritto* (Laterza 2006) 187.

²³ A. Cicu, ‘Gli automi nel diritto private’ (1901) *Il Filangieri* 561 ss., an essay fully quoted in *Scritti minori di Antonio Cicu, II, Successioni e donazione – Studi vari* (Giuffrè 1965), 287 ff.

²⁴ W. Auwers, *Der Rechtsschutz der automatischen Wage nach gemeinem Recht* (Göttingen 1891), 5 ff.

²⁵ Let me refer to E. Damiani, ‘Note in tema di conclusione del contratto mediante sistemi automatici (spunti per una rilettura delle tesi di Antonio Cicu)’ (2020) *Rassegna di diritto civile* 747.

²⁶ N. Irti, ‘Scambi senza accordo’ (1998) *Rivista trimestrale di diritto e procedura civile* 347. This work was followed by the criticism by G. Oppo, ‘Disumanizzazione del contratto?’ (1998) *Rivista di diritto civile* 525, followed by the reply by N. Irti, ‘E’ vero ma...’ (replica a Giorgio Oppo)’ (1999) *Rivista di diritto civile* 273; as well as the criticism by C. M. Bianca, *Diritto Civile. Vol. III – Il contratto* (Giuffrè 2000) 43 ff. To which there was the counter-reply by N. Irti, ‘Lo scambio di foulards (replica semiseria al Prof. Bianca)’ (2000) *Rivista trimestrale di diritto e procedura civile* 601, to which there was the reply by C. M. Bianca, ‘Acontrattualità dei contratti di massa?’ (2001) *Vita notarile* 1120; F. Gazzoni, ‘Contatto reale e contatto fisico (ovverosia l’accordo contrattuale sui trampoli)’, in *Studi in onore di C.M. Bianca* (Vol. III, Milano 2006) 313ff.

interaction in complex environments, such as the search for information in the web, the interaction with possible human or artificial counterparts autonomously and without external requests²⁷.

Recently the European Bank for Reconstruction and Development has published a study²⁸ on its website where, trying to give the legislators of the European States members some guidelines about *smart contracts*, it interestingly questioned about, for example, the possibility of introducing the concept of “electronic person” with reference to the *automated software* able to finalise contracts autonomously, basing on the models of artificial intelligence and *machine learning*²⁹ techniques.

If it is out of any doubt that technological progress realizes a speed in the exchange operations of goods and services it is also true that the *smart contracts*, being IT protocols automatically executing the performances stated in the contract when given conditions, verified through the use of automatic techniques, take place. *Smart contracts* do not enable the parties to use their autonomy in the execution phase of the contract, possibly exercising the right of withdrawal, depriving them of the right of using a discretionary interpretation of the contract clauses³⁰.

The issue of determining the personal identity of the parties and the one of the exact singling out of the correspondence between the will of the contractors, the effects arising from the clauses in the contract and the compliance of the limits and the obligations stated by the legal system is still uncertain.

In such a context the intervention of a qualified intermediary is appropriate, and therefore that could also be the Notary, who not only performs the function of a certifying agent but also the one of examining the will of the parties and the one of suggesting in order to adjust it to better realise the ultimate goal the contractors want to pursue³¹.

Those functions in fact, as those aimed at verifying the identity of the parties and their capacity of acting, will barely be implemented in an IT programme due to which there will always be an exposed area for which maintaining the control of man upon technology is desirable.

²⁷ G. Sartor, ‘Gli agenti software: nuovi soggetti del cyberdiritto?’ (2002) *Contratto e impresa* 466; Rinaldi (n. 5) 344.

²⁸ *Smart Contracts: Legal Framework and Proposed Guidelines for Lawmakers* (5 November 2018) Clifford-Chance <www.ebrd.com/documents/legal-reform/pdf-smart-contracts-legal-framework-and-proposed-guidelines-for-lawmakers.pdf?blobnocache=true>.

²⁹ Rinaldi (n. 5) 345.

³⁰ See Signori (n. 14) 429 ff.

³¹ *Ibid.*, 431, recalling the example given by M. D’Orazi Flavoni, ‘La funzione sociale del Notaio’ 1954 *Rivista del notariato* 405.