Blockchain: technological, business and legal aspects

Blockchain: aspectos tecnológicos, empresariales y legales

David López Jiménez*
http://www.researcherid.com/rid/N-6460-2013
EAE Business School, España

Work reviewed: Ramón Vilarroig Moya & Carmen Pastor Sempere. (2018). *Blockchain: aspectos tecnológicos, empresariales y legales***. Navarra, Spain: Thomson Reuters Aranzadi.**

Reality reveals that recent and disruptive advances occurring in new technologies –that are evolving at a faster pace– are having a remarkable incidence on the way we communicate, work or perform consumption actions. We are witnessing, in these scenarios and in many others, an unprecedented social change. Society –and, therefore, the public sector and the private sector– are more influenced by information and communication technologies (ICT). By the same token, we can conclude that the digitalization played by society is called to the consolidation of a new order where we are immersed. We refer to the suggesting structure which starts with the block chain. The *Blockchain*, indeed, arises in a technology that may have a relevant impact on consumers or users and entrepreneurs.

In a short time, on the basis of this platform, the so-called smart contract or intelligent contracts shall be implemented, with certain regularity and dynamism which, in spite of their name, are not, strictly speaking, contracts but a sequence of codes and data only. In this respect, some additional evaluations are to be made. In the smart contract, although the covenant or agreement is entered into between the parties, it may be in writing or drafted in human language, at least a percentage shall be transcribed to a programming code, which is a self-executable function.

Rules and consequences are included in the contract, and, although, different from nineteenth-century contracts, the execution mechanism shall not be subject to the good will of the parties but to a program that will work automatically when the execution rules are identified, so that an order may be carried out with an automatic response,

* PhD. (European mention) by the University of Sevilla and PhD. by the University of King Juan Carlos. Full Professor at EAE Business School, Spain.

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1

programming a payment to support the block chain may be possible, a payment that will normally be made in cryptocurrency. In addition, intelligent contracts have a number of prerogatives.

Indeed, its scripts may be programmed as a series, in a simple manner, as they are incorporated in the *Blockchain*. If an unchaining event takes place in this contract, the transaction is submitted to a specific address. Once the inherent complexity has been overcome, with a guaranteed execution, they move fast, in a simple and immutable manner, and above all, with a guaranteed execution, as regret will not be allowed (which ought not to be confused with discontinuance). Naturally, intelligent contracts are usually created with the purpose of producing legal effects, provided that the necessary conditions are in place for its automatic execution.

In intelligent legal contracts, as in any other contract, the parties may agree that the compulsory obligation be submitted to a specific condition. Evaluation of the occurrence of the latter is made by a third party called oracle; this is about external companies, with respect to the block chain, which may have facilitated the program all kinds of information and which may have created its own software that allows them to interact with the smart contract. The activity performed by oracles, in their interaction with the block chain, is that of a third party who is reliable and neutral. One of the most suggesting aspects of intelligent contracts are pecuniary considerations incorporated therein. Under this contract mode, just as in the ordinary type of contracts, there is a concentrated nexus where at least one of the considerations may be qualified as economic.

The problem lies in the fact that several block chains demand that economic transactions be done with their own cryptocurrency. The most known is the bitcoin, (without prejudice that there are many others such as *etheric*, *litecoin*, *ripple* and *dogecoin*), which has resulted not only as an automated means of electronic payment, but also as a speculative investment instrument and, in addition, as a tax evasion and money laundering instrument. A large part of the automated payment transactions is done through cryptocurrency systems which, although the latter lack recognized legal status, and with a minimum of legal security, they are legal and admissible.

Application of this novelty and promising technology of a user's daily life has served for some people to resort to *Blockchain* as some kind of technological revolution, which is positioned at the same level as Internet. It is forecasted, by some, that this new technology will displace nineteenth century authorities of centralized nature, who, until now, have operated in many and varied fields, among which we can refer to communications and businesses.

The monography we refer to in this review, makes a comprehensive and multidisciplinary examination of the technology of the block chain. The work is comprised of four fully differentiable blocks, with a total of ten independent chapters.

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2

Below we will discuss, in a superficial manner, each of them, by formulating the relevant evaluations. Before we get down to business, so to speak, some brief notes are to be mentioned, as a result of the work's prologue. In the words of the prologue maker, Pedreña Muñoz, artificial intelligence, the internet of things and the block chain will create an important turmoil in the current economic systems.

The countries, sectors, companies, consumers and users who place themselves correctly, shall hold admittedly notable prerogatives, while the most conservatives will maybe avoid any risks, but, naturally, will be more dependent. Both *bitcoin* and *Blockchain* are placed in the revolution of open innovation, however of collaborative economy as well.

If we look back to a few months, we should stop in the events of Friday, 12 May 2017, when the whole media in the world opened with information of WannaCry. Although some do not recall this name, it must be said that this is a global ransomware which affected more than 230,000 computer devices worldwide. People who were behind this computer infection demanded a ransom of 300 dollars in bitcoins in exchange for deciphering the archives.

To most of the people, this meant one of the first public quotes about this form of virtual payment. Thus, a sector of the population immediately catalogued it as an exchange currency in the Deep Web, associating it with cybercrime, trafficking of arms, and other illegal businesses. Deep or concealed web arises in an unreachable Internet territory according to search engines like Google, Bingo or Yahoo, among others, because their pages are not usually registered in DNS servers. It is believed that concealed Internet is 95% of information on Internet, and it is formed by a number of private and peer-to-peer, recorded with .onion extensions to which access may be done by means of specific addresses or passwords, employing specific navigators like Tor, 12P and Freenet.

The latter is not at all rigorous or fit with reality. Indeed, bitcoin is extraordinarily volatile, it arises as a virtual currency to which multiple business typologies have resorted to throughout the world (real estate, food, banking and a long et cetera). Although bitcoin has lost more than 80% of its value since 2017 –note that it reached 20,000 dollars– the real estate market has not stopped shaking by these unwavering falls. In the year when the so-called cryptocurrency reached its historic high, real estate sales using the bitcoin gradually became more popular.

The real estate market, with a general character and in broad terms –houses, apartments, luxury residences and land– is being negotiated, in this moment, with cryptocurrencies, without having had a notable impact on the falling market that has affected this phenomenon since 2018.

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3

The global society has started to detach from the financial activity outlined in the shadow of the bitcoin to focus on the opportunities and the potential of the block chain, that is, the technology which supports the virtual currency. Indeed, the facts reveal that the block chain has a promising future.

In recent times, noteworthy events have occurred which ought not to go unnoticed. In 2017, two great events have taken place: the exponential growth of *Ethereum*, one of the main rivals of Bitcoin, and the massive and frequent resource of ICOs (Initial Coin Offering) as an alternative option for the traditional risk capital for financing the so-called startups. Within the latter, we found that, in common parlance, they are called unicorns; although this term refers to a mythological animal, in business it has a very different connotation, as this refers to a technological company reaching a value of 1 billion dollars in the stage of its capital raising process. If we had to give some characteristics of these suggestive companies, a large number could be mentioned.

In this sense, we can say that unicorn companies arose in the social networks age, and were capable of making use of their boom to grow and, later, to consolidate. They are companies that, likewise, make use of the B2C model, in other terms, they develop a commercial strategy to reach the customer or the final consumer directly.

Plunging into the work, the first section consists of two chapters. In the first one, computer and technical foundations of the *Blockchain* are addressed. The bases included in this chapter will allow us to understand the legal, technological and taxing aspects; in addition, among other questions, general aspects of the block chain are studied (open code, tokens and cryptocurrency, public or authorized networks, mining nodes and wallets) and the particularities of the Bitcoin are addressed, with special attention on the elemental concepts of cryptography, the structure of the block chain and the operation of the *Blockchain* network. After this, an examination of especially suggestive questions is addressed, within which we can refer to alternative cryptocurrencies –*Namecoin*; *Litecoin*; and *Peercoi*n– to *Blockchain* 2.0 platforms –among which are Ethereum, Curdano, IOTA, NEO, and NEM– and *Hyperledger* as a paradigm of private block chains.

This first chapter ends with the number of prerogatives of the block chain, among which we can refer, without intent of being tiring, to process disintermediation, total decentralization of the information, public transparency, privacy for data protection and cost reduction in specific aspects of information processing technologies. The second chapter of the first section refers to value Internet, and deepens on the block chain as the value Internet that is giving way to businesses that are gradually detaching from depending on physical assets.

The analysis of smart contracts is specially suggesting. So to speak, value Internet emerges in a network modulated by people who create content without intermediaries, where, in turn, the users themselves are both senders and receivers.

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4

Currently prevailing block chains may be public –in the assumption that they are open to anyone who may want to partake– or private –in case only some may partake.

The first paradigm in public block chains is the Bitcoin, created in 2009 by Satoshi Nakamoto (whose identity is unknown, where this name is a nickname). Both in one case and in the other (public or private) the participation of a central entity is necessary to do supervisory tasks or authorize processes and contents. Absolutely, one of the inherent characteristics is decentralization. The block chain has a large number of prerogatives; in fact, among them, we can mention that a specific typology of third parties shall not be necessary for two parties to perform a transaction.

This affirmation is transposable, among other actors, to Banks, notaries, auditors, copyright societies, or, even, payment intermediaries such as PayPal. For that purpose, P2P exchange technology between peers –peer-to-peer– is harmonized by cryptography –data encryption. Ultimately, block chain enables two peers (equals) to market assets without the need to make double expenses on the exchange, and, therefore, to capture the asset.

The commercial and taxing aspects comprise the subject of analysis of the following section, which includes three chapters. In the first one, the particularities suggested by the block chain as a registry are analyzed and the operation is examined both by the DNS –Domain Name System– and by the ICANN which, as is known, emerges into a name manager. The block chain poses a number of dilemmas; one of them is its use as a registry with certain legal purposes, where annotations therein are irreversible. All of this prevents the information entered therein from being altered *a posteriori*, for decentralization thereof will make it possible that any data alteration be detected by the whole Network; note that everyone partaking in the block chain has the same information.

The purpose of the second chapter is to examine trade-related aspects of crypto coins; likewise, the diverse and prevailing token modes are analyzed: utility tokens, tokens security and equity tokens. It is believed that crypto coins comprise multipurpose crypto assets, that may be employed as a means of payment which, in the terms of Article 1170 of the Spanish Civil Code, has a discharging effect. In the last chapter of this second section accounting and taxing aspects are dealt with; like the fact that crypto coins are also subject to pay domestic taxes (Added Value Tax, Income Tax of Physical Persons, Economic Activities Tax).

In the specific case of Spain,   users shall have to report to the Tax Authorities of any operation and balance in crypto coins, both in Spain and abroad; an action where, by the way, tax evasion may be circumvented by concealing wealth from tax authorities.

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5

Section three of the monography deals with entrepreneurial, organizational and accounting aspects of the block chain. The development which states are experiencing is linked to entrepreneurship; the countries that promote it are the countries with the highest growth rates. Linked to what is presented, there is no question that technology is highly related to the entrepreneurial activity. In this line, an obvious aspect, however very significant, is that the block chain is giving rise to an infinite field of business opportunities which, until relatively recently, were unimaginable. The block chain comprises a tool of a disruptive character that fully changes the world of business. Although, if we are allowed a simile, this is not the Holy Grail, it is in the position to change the nineteenth-century parameters of the industry.

As previously anticipated, this is a decentralized database, with stored procedures, particularities already implemented for years. In the last chapter of this suggesting section, the accounting of the triple entry and the implications posed by the block chain are addressed. The latter, among other things, enables information, verification and transparency instruments. It is convenient to reach an international harmonization by virtue of which standards and a normative standard are implemented that would make it possible to apply the *Blockchain* platforms and interoperability thereof.

As rightly required by the authors of this last chapter, the protection of investors and consumers of the new products being offered on the Internet shall have to be resolved in such a way that this does not prevent the progress of developments posed by the block chain, which are very promising for the efficacy in the management of and transparency of the public management.

The fourth and last section of the work is devoted to the applications which the block chain may offer to the Public Administration, digital identity and citizens' participation. Within this suggesting section, there are two independent chapters, whose content is truly suggesting. *Blockchain* has a number of prerogatives for the public sector; within which we can mention, among others, the possibility that it is useful for the Tax Authorities, contributing to the prevention of fraud and money laundering.

In the security field, national identity documents (NID) should progress towards a technology linked to the block chain that would uphold the fundamental rights of individuals, like, for example, voting processes. Likewise, in the specific case of Health, waiting lists could be improved as well as admission techniques. It can safely be affirmed that we have reached the time for the Administration to take a step forward and, in a way, stops acting being urged by the private company.

In other terms, it is desirable and necessary that the public sector invests in the block chain, so that it would not lose its dominant role in managing information. Unless it does so, this would be a handicap that may be prevented for the society. Incorporating public bodies to initiatives like, among others, the Alastria Consortium, is excellent news,

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6

and, in this sense, we must briefly state what the latter represents. It must be emphasized that this is formed by the main Spanish companies in the banking, telecommunications and energy sectors. This is about the first national state network that has been created under the block chain system; it is a non-profit consortium devoted to the development of distributed registry technology. In a way, it has all the prescriptive elements to be the new data exchange ecosystem, for, no question about it, it is in the position to attain digital transformation of the diverse industrial and entrepreneurial sectors.

We are in the position of claiming that data management be more efficient, more secure and, above all, more social; and *Blockchain* is the ideal tool for this purpose.

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7