LEGAL EDUCATION AND THE NEW TECHNOLOGIES – FUTURE LEGAL PROFESSIONALS

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ABSTRACT

Law graduates require that courses enable graduates to understand the impact of new technologies on the legal area. By asking what these new technologies are whose influence on Law makes learning them crucial and how they interact with the legal world, this article seeks to describe blockchain, artificial intelligence and big data and examine their current and potential applications with a direct influence on legal topics and the work of legal professionals, as well as the importance these professionals give to the topic and the level of access to training they have. The research is bibliographic and documental. The study has a descriptive and exploratory nature, through a qualitative approach of theoretical nature. It was found that the technologies studied already influence legal work and their importance tends to increase. The use of new tools will require a critical vision from professionals and their teaching in universities is essential, especially for the self-employed.

Keywords: *Law; Legal Education; Digital age; Legal Technology; Big data; Blockchain; Artificial intelligence and new technologies.*

Introduction

Technological innovations such as blockchain, artificial intelligence, big data and learning machines have imposed rapid changes on society and the economy, with evident implications for law. The introduction of such elements in the new legal curriculum to provide future bachelors with training compatible with the 21st century and the challenges presented

by the digital era. The question is, however, which *new technologies* are those whose influence on Law makes their learning crucial and how they interact with the legal world.[1]

Based on this, we seek to describe three of these new technologies, blockchain, artificial intelligence and big data, and examine their current and potential applications with direct influence on legal topics and on the work of legal professionals, as well as the importance these professionals give to the topic and the level of access to training they have. The new regulation (NEP) going to implement new guidelines in curricula, which makes this debate relevant and pressing.

The research adopts bibliographical and documental sources, such as books, articles in periodicals, theses and dissertations available in the BDTD, SciELO, EBSCO, SSRN, ResearchGate, Google Scholar and Portal Periódicos CAPES bases, as well as data and information made available on journalistic sites and public and private institutions in the legal area, with special focus on the production of the last five years, so as to reflect the state of the art of the technologies studied.[2]

The study has a descriptive and exploratory nature, since it will seek to investigate the applications of new technologies, the changes they have caused to the legal universe and the impressions of legal professionals, through a qualitative approach of a theoretical nature.[3]

New Technologies and the Law

The identification of the content of the term *new technologies* and the discussion about its relations with Law are essential in the present scenario. In this sense, the first step towards its implementation would encompass knowledge about the new technologies that have influenced Law and human relations in general, with repercussions in the legal environment.[4]

In describing what he calls the Fourth Industrial Revolution, Emerging technologies and large-scale innovations are spreading much more widely and rapidly than others. Market leaders and their customers tend to ignore new technologies at their emergence. However, that the acceptance of the new technology may lead users to an accelerated change, while service providers will often be late in recognising the scenario transformation and will hardly recover

[1] Fenwick, Mark et al., *Legal Education in a Digital Age: Why 'Coding for Lawyers' Matters*, Lex Research Topics in Corporate Law & Economics - Legal Studies Research Paper No. 18-21 (2018).
[2] Erwin N. Griswold, *The Future of Legal Education*, 5 J. Legal Educ. 438 (1952-1953).
[3] Chou, S-W, & Liu, C-H, *Learning effectiveness in a Web-based Virtual Learning Environment: A Learner Control Perspective*, 21(1) Journal of Computer Assisted Learning, 65-76 (2005).
[4] Beetham, H. & Sharpe, R. (eds.) *Rethinking Pedagogy for a Digital Age: Designing and Delivering*, e-learning (London: Routledge, 2007).

the lost market. Among the authors, one observes a permanent indication of urgency, revealing that evolutions and propagations have been faster when it comes to digital technologies.[5]

In addition to their rapid dissemination, some of these technologies function as support for the development of new applications, whose potential is equally revolutionary - as occurs with the internet itself. This definition includes blockchain, artificial intelligence and big data, which will be analysed in greater detail below, together with machine learning, intrinsically related to the technology of artificial intelligence, and Jurimetrics, a study which, although pre-existent, has seen a substantial increase since the development of big data.[6]

Blockchain

The significant appreciation of Bitcoin during 2017 brought cryptocurrencies to the attention of the general public, whose issuance and control of ownership do not go through the sieve of a central bank, as is the case with traditional currencies. The new means of exchange, proposed anonymously under the pseudonym Satoshi Nakamoto, also popularized the expression blockchain, considered as the technology that allowed, from the decentralization model, the emergence of cryptocurrencies. The blockchain was the invention that enabled a digital monetary and payment system, decentralized and encrypted, without the need for a regulatory body.[7]

Blockchain is a decentralised and cryptographic record of immutable data replicated and distributed to each member or node of a peer-to-peer network. The author clarifies that the term is often treated as synonymous with distributed ledger technology or DLT, although the latter is a genus of which the former is a species. In simple terms, blockchain would be a chronological database of transactions recorded by a computer network. In their description, each blockchain is encrypted and organised into a smaller data set called a *block*, which contains information about a certain number of transactions, a reference to the preceding block in the chain and an answer to a complex mathematical puzzle, which is used to validate the data associated with the respective block.[8]

The technology, therefore, involves a chain of blocks, each of which contains its own data, references the immediately preceding block and enables mathematical confirmation of

[5] W. Warren H. Binford, *Envisioning a Twenty-First Century Legal Education*, 43 Wash. U. J. L. & Pol'y 157 (2013).
[6] Sheldon Krantz & Michael Millemann, *Legal Education in Transition: Trends and Their Implications*, 94 Neb. L. Rev. 1 (2015-2016)
[7] Kevin Werbach, *Trust, but Verify: Why the Blockchain Needs the Law*, 33(2) Berkeley Tech. L.J., 487-550 (2018).
[8] Christopher Millard, *Blockchain and law: Incompatible codes?*, 34(4) Comput. Law Secur. Rev., 843-846 (2018).

the integrity of the data contained and, consequently, of the order of the blocks. The verification and storage of the blocks involves a network of machines working together, without the need for a matrix server.[9]

The characteristic of the blockchain to be highlighted for the purposes of this article is exactly the decentralization, since the management takes place from a mathematical and computational consensus (obtained by a mechanism called Proof-of-Work or simply PoW) between the machines that form the network. This concept is opposed to the model of a central server, whose maintainer has control over the database it hosts. The second standard is the basis for, for example, reserve banks when issuing currencies, real estate notaries when registering real estate transactions and electoral courts when counting votes. Although only applications related to cryptocurrencies are currently popular, significant changes are already being considered as a result of the use of distributed registration technology in the other cases cited.[10]

In the electoral area, some states already make use of an electronic voting system via internet, whilst few states experimented with similar programs, which were discontinued due to data security concerns. As a way to overcome the problems encountered in these places, the author proposes a solution, via the use of blockchain, which allows authentication, anonymity, accuracy and verifiability.

Under such premises, the technology would be able to solve the debate around transparency and efficacy, which provided for the printing of the electronic voting record, in order to enable the audit of the vote, by checking the ballot box data with the content of the printed votes. The device, however, was provisionally suspended on the grounds of risk of breach of secrecy and freedom of choice. With the adoption of blockchain, the printing of votes would be unnecessary, since the system would enable auditing and anonymity.[11]

There are also prospects for major transformations in the notarial sector. A public, transparent and decentralised database such as blockchain is applicable for the management of real estate records, with the following benefits: accurate date and time recording of transactions; data recovery in the event of a disaster as the system is not based on a single server; immutability of the record of transactions; and management of the record data by blockchain applications. In addition, the technology would add levels of security, auditability

[9] John O. Sonsteng et al., *A Legal Education Renaissance: A Practical Approach for the Twenty-First Century*, 34 Wm. Mitchell L. Rev. 303 (2007-2008)

[10] Koskela, M, et al., *Suitability of a Virtual Learning Environment for Higher Education*, 3(1) The Electronic Journal of e-Learning, 21-30 (2005).

[11] Ronald W. Staudt, *Introduction, Justice, Lawyering and Legal Education in the Digital Age*, 88 Chi.-Kent L. Rev. 687 (2013).

and transparency, as well as being less vulnerable to abuse by notaries or to data destruction, natural or caused - the practice of land grabbing, for example, would be avoided. Another field whose influence of blockchain should soon be noticed is tax. A World Economic Forum survey of more than 800 executives and experts from the technology and communications sectors, reveals that in 2023 taxes will be collected via blockchain for the first time, with unknown impacts in relation to central banks, monetary policy, corruption, real- time taxation and the role of government. Respondents further estimate that by 2027, 10% of the world's gross domestic product will be stored on blockchain technology, while in the year 2015 that figure would have been 0.025% (20 billion US dollars out of a total of 80 trillion US dollars).[12]

The decentralization promoted by the blockchain tends to provide a devolution of power from the State to citizens and is a key element to achieve equality, transparency and freedom. In more concrete terms, the research prepared by the World Economic Forum indicates that from the adoption of the technology, a greater financial inclusion of emerging markets is expected, while financial services in the blockchain gain critical mass; decrease in the intermediation of financial institutions, due to the creation of new services and the exchange of values directly in the blockchain; significant increase in tradable assets, due to the broad business possibilities that can be carried out via blockchain; improvement in property registries in emerging markets; legal contracts and services based on algorithms and connected to blockchain (smart contracts); and increased transparency.[13]

The widely observed optimistic vision may come to be contradicted as of the moment blockchain technology is implemented more extensively and its possible limitations come to be noted. However, it seems inevitable that this technology will be increasingly ingrained in social, commercial, economic and legal relations, which justifies the attention of the legal professional on the topic.

Artificial intelligence and machine learning

Artificial intelligence involves an autonomous system capable of using advanced learning algorithms to match or surpass human intelligence. This intelligence varies between two dimensions, reasoning and behaviour, and two outcome measures, human performance and an ideal concept of intelligence, called rationality. In this sense, the idea of artificial intelligence would encompass systems that think or act like humans and systems that think or act rationally. In a conception focused on the objective of legal regulation of the matter and

[12] Usha R. Rodrigues, *Law and the Blockchain*, 104 Lowa L. Rev. 679 (2018-2019).
[13] Koskela, M, et al., *Suitability of a Virtual Learning Environment for Higher Education*, 3(1) The Electronic Journal of e-Learning, 21-30 (2005).

less anthropocentric, artificial intelligence as the ability of a non-natural entity to make choices through an evaluative process.[14]

In any of the perspectives, the capacity of assimilation and self-training is essential to reach an intelligent machine. This aptitude, called machine learning, contemplates, the systematic study of algorithms and systems that improve their knowledge or performance through experience. Machine learning, therefore, is the absorption of knowledge by the machine itself, while artificial intelligence covers the machine performance based on the acquired knowledge.[15]

Improvements in these techniques have enabled machines to defeat great chess champions, fly sophisticated aircraft, perform delicate surgery and study the Martian surface. Technology has also provided advances in the study of animal behaviour. In the health field that modelling created by private companies anticipated the pandemic of COVID-19 and suggest that these experiences will influence urban health policies at the international level. Specifically in the legal area, some experiences with artificial intelligence have been developed, such as COMPAS, in the United States, Prometea, in Argentina, and Victor Project, arising from a partnership between the Federal Supreme Court and the University of Brasilia.[16]

The COMPAS application, an acronym for Correctional Offender Management Profiling for Alternative Sanctions, is a private risk assessment tool inspired by what is used in the insurance area, used by the judiciary to support decisions by scoring offenders on a scale of possibility of re-offending. Aprioristically, the adoption of software of this type would tend to make the criteria used in sentencing more objective, avoiding subjective interference by the judge that could lead to injustices or discrepancies between decisions handed down by different judges in identical situations. Artificial intelligence, therefore, would be beneficial to the judicial system, in a first vision.[17]

However, questions are already being raised about the possible reproduction, by intelligent machines, of biases or prejudices absorbed during the process of elaboration or training of programs. It is humans who define the algorithms, the databases that will be used for machine training, the assumptions that must be taken into consideration, among other relevant issues for the operation of the software. Such assumptions would be capable of introducing subjective biases in the results of the apparently objective performance of the

[14] Margarita Robles Carrillo, *Artificial intelligence: From ethics to law*, 44(6) Tel. Plcy., 335-367 (2020).
[15] Bench-Capon, T., *Argument in Artificial Intelligence and Law*, 5 Arti. Intel. Law, 249–261 (1997).
[16] Harry Surden, *Machine Learning and Law*, 89 Wash. L. Rev., 87 (2014).
[17] Maharg, P. *Transforming Legal Education: Learning and Teaching the Law in the Early Twenty-First Century* (Aldershot: Ashgate, 2007)

programs. Although the works done with the help of these technologies have been criticized by the company that created and maintains the software, the scenario presented shows that legal professionals will need knowledge that goes beyond the law and jurisprudence to understand and question the sentences of the future.[18]

In few counties like Latin America, artificial intelligence systems have been introduced in administrative and organizational activities, so that discussions on concrete cases involving the judicial use of intelligent machines are still incipient. The software Prometea was developed as a friendly interface to assist and expedite the work of the Public Prosecutor's Office, offering models, laws and decrees according to the need dictated by voice or typed by the user and automatically verifying compliance with formal requirements. Still in the experimental phase, the tool is considered by the author as a qualitative leap in relation to speed and accuracy of daily work. When dealing with artificial intelligence in general, however, a certain human intervention would be necessary for the result of the processing by the systems to be legitimate, respectful and promoting the effectiveness of fundamental rights.[19]

The recent Victor Project - considered by the Supreme Federal Court the most relevant Brazilian academic project related to the application of artificial intelligence in Law - will also have only administrative, and not jurisdictional, functions. The software has the initial purpose of analysing extraordinary appeals filed with the Supreme Court and, if applicable, linking them to the corresponding issues of general repercussion, speeding up the initial phase of processing of appeals in that court. The initiatives of the Courts, for instance, robots that speed up the blocking of debtors' assets, a system that screens tax foreclosures, and software capable of identifying appeals with requests whose merit has already been decided with binding effect by the courts, and many more start-ups are stressing the importance of intersection between Law and technology.[20]

The development of artificial intelligence has attracted the attention not only of public and private institutions, but also of regulatory bodies. The European Union, through European Parliament Resolution 2015/2103, made a series of recommendations to the European Commission to present a proposal for a directive on civil law on robotics, listing hypotheses

[18] Jon M. Garon, *Legal Education in Disruption: The Headwinds and Tailwinds of Technology*, 45 Conn. L. Rev. 1165 (2012-2013).
[19] S. Raaijmakers, *Artificial Intelligence for Law Enforcement: Challenges and Opportunities*, 17(5) IEEE Security & Privacy, 74-77 (2019).
[20] Možina, M., Žabkar, et al, *Argument Based Machine Learning Applied to Law*, 13 Artif Intell Law, 53–73 (2005).

and showing concern about the consequences of the operation of autonomous machines for which there is no legal provision.[21]

As can be seen, artificial intelligence is already present in various areas of Law, although many of the initiatives are still at a preliminary stage and there is little regulation. It can be seen that its field of action is vast, with potential uses not only in the administrative or operational sphere, but also capable of influencing the merit of the legal professional's work.[22]

Big data and Jurimetrics

A remarkable feature of the 21st century has been the transformation of people and things into large and continuous producers of content. The miniaturisation and popularisation of devices with ever more sensors and processing and storage capacity have given rise to a volume of data that matters in raw materials of great economic value. In this sense, the term big data appears to describe this extensive database, whose management and analysis require atypical treatment and have provided useful information for decision making in various areas.[23] Considering that one of the main sources of big data are the acts and interactions of individuals on their mobile phones, computers and social networks, whose record is captured by governments and global conglomerates in the digital area such as Google, Facebook and Amazon, the right to privacy arises as an eminent concern of jurists. The main discussion does not reside in the ethical or philosophical question about the protection of privacy, which must be safeguarded, but in the established business model, since information has become not only the wealth of this new century but also the currency of payment - since users have received so-called free services in exchange for the assignment of their personal data.[24]

From this perspective, identify three paradoxes of big data: transparency, identity and power. Regarding transparency, they assess that the technology promises to make the world more transparent from the use of information provided by users, but the collection of data is invisible and the tools and techniques are opaque, shrouded in secrecy. In the second case, the authors indicate that big data seeks to identify, while threatening identity. This occurs because, by recognizing characteristics in a particular individual, algorithms begin to influence him or her through the targeted supply of content, creating echo chambers of thoughts with the potential to condition the user. Finally, they add that big data is touted as a tool that gives users

[21] Asimow, M., *Bad Lawyers in the Movies*, 24 Nova Law Review 533 (2000).
[22] Surden, Harry, *Artificial Intelligence and Law: An Overview*, 35 Ga. St. U. L. Rev., 19-22 (2019).
[23] Craig John & Newbery-Jones, *Trying to do the right thing: experiential learning, e-learning and employability skills in modern legal education*, 6(1) Eur. J. Law Tech., 1-26 (2015)
[24] Sandra Watcher, *A Right to Reasonable Inferences: Re-Thinking Data Protection Law in the Age of Big Data and AI*, Colum. Bus. L. Rev., 494 (2019).

a clearer view of the world. However, the data would predominantly be in the hands of powerful institutions, governmental or private, and not with ordinary people. With this, the content generators would be transferring power to those who manage the data and, from them, they can make inferences and decisions, generating the paradox of power.[25]

Big data technology has also directly influenced the work of legal professionals. This new informational panorama has developed from the implementation of electronic journals, the computerisation of courts and law firms and the adoption of the electronic judicial process, which has taken the data from physical records, until then predominantly available in person, to public and private repositories, many of them propagated on the Internet. As a result, the courts have become disseminators of information which, although public, was protected by practical obscurity, an expression alluding to the difficulties imposed on the reach of open data which, in practice, makes it generally inaccessible. The excessive publicity would generate, according to the author, the need for measures to re-establish the balance between privacy and judicial transparency. During the COVID-19 pandemic, which caused the unplanned virtualization of hearings and trial sessions, the problem was evidenced from episodes of virtual vandalism that occurred during acts of the kind.[26]

On the other hand, the proliferation of data has facilitated the development of Jurimetrics, a term that refers to the statistical analysis of Law, notably of judicial decisions. Jurimetrics as the empirical study of the form, meaning and practice (and their relations with each other) of state pronouncements with the aid of mathematical models and using rationality as the basic paradigm for the prediction of human behaviour. It may be segmented into three prisms: that of legislative drafting and public management, that of judicial decision and that of evidentiary instruction, so as to provide scientific support, through the analysis of empirical data, for deliberations in these areas, in which legal, political and economic aspects are commonly evaluated only subjectively, without well-defined criteria. The authors consider that Jurimetrics may render the legal application coherent, standardized and, consequently, closer to reality by enabling methodological grounding and the creation of structured processes.[27]

The combination of blockchain, artificial intelligence, big data and legal metrics is among the perspectives for the use of new technologies in Law. With the increased presence

[25] Sarah Brayne, *The Criminal Law and Law Enforcement Implications of Big Data*, 14(1) Annual Review of Law and Social Science, 293-308 (2018)
[26] Lyria Bennett Moses and Janet Chan, *Using Big Data for Legal and Law Enforcement Decisions: Testing the new tools*, 37(2) University of New South Wales Law Journal, 643-678 (2014).
[27] Saxer, *Shelley Ross, One Professor's Approach to Increasing Technology Use in Legal Education*, 6(4) Richmond Journal of Law and Technology, 34-64 (2000).

of these tools in everyday life, the debate on the objectivity or subjectivity of algorithms will certainly become more heated, as will the control of this data and how the answers provided by the machines may be questioned by judges, parties and citizens in general.[28]

Conclusion

Although the expression "new technologies" appears only in resolution, recommendations of various committees reports. It is needed for the Law undergraduate course to enable the student to master the technologies necessary for the permanent understanding and application of Law. This provision was reiterated in the new regulations, obliging Brazilian higher education institutions to offer training in this regard. Lawyers must keep up-to-date with the law and their practice, including the benefits and risks associated with the relevant technology.

Since the applications of technologies such as blockchain, artificial intelligence and big data are already influencing the work of Law professionals and the trend is that the understanding and handling of these tools will become essential.

It was observed that the adoption of technologies will require a critical view over them, given that their application has subjective factors that affect the results obtained, despite a supposed neutrality that might be suggested under common sense. In the case of artificial intelligence and big data, a theory that seeks to highlight such circumstances was glimpsed, which is less present in the case of blockchain, possibly due to the short time since its emergence and a still idealized vision about its potential. In this sense, teaching related to technologies at universities proves to be even more important so as to confer greater reflection as to future bachelors' contact with new technologies. In the academic environment for those who will practice their profession alone, future training opportunities tend to be small and competition with large law firms, with more robust training programmes, may marginalise these professionals.

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[28] Fallows, S. & Steven, C., *Building Employability Skills into the Higher Education Curriculum: A University-Wide Initiative*, 42 Education and Training, 75 –83 (2000).