Why Natural Language Processing is Indispensable to Entrench Brazil's Precedents System

Innovation and performance in justice organizations

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ABSTRACT

Since 1963, Brazil has tried to approximate its civil law system to a system based on precedents, especially due to the fact that it has an enormous litigation rate, with more than seventy-seven million lawsuits in progress. However, in order to consolidate a system of precedents, it is indispensable that tried cases, first of all, may be searchable and able to be found. Stated these preliminary considerations, this draft exposes some manners in which artificial intelligence, by natural language processing, can enhance digital research tools and, consequently, how it can contribute to social benefits such as legal certainty, isonomy, celerity, reduction of Judiciary costs, and due process of law. In order to prove these arguments, this draft was written based on a review of pertinent literature, and is structured as follows: Section 1 introduces the theme with some preliminary considerations; Section 2 explains Brazil's case law system's evolution throughout the last sixty years; Section 3 exposes how natural language processing can significantly contribute in this novel system; Subsection 3.1 presents some natural language processing techniques applicable to retrieve information about case law; Section 4 provides critiques regarding the use of artificial intelligence in law; and Section 5 presents the final considerations.

Keywords: Civil law; Common Law; Natural Language Processing; Legal Certainty; Isonomy.

1 Introduction

In 2019, there were approximately seventy-seven million lawsuits in progress in Brazil's judiciary system (Conselho Nacional de Justiça [CNJ], 2020). One year earlier, in 2018, Brazil's Superior Tribunal de Justiça (Superior Tribunal of Justice), responsible for deciding appeals from state and federal courts, in cases non-related to constitutional matters, decided more than 500 thousand cases, of which 377,574 were decided in a definitive manner (Superior Tribunal de Justiça [STJ], 2019). This means that each of its 33 judges decided approximately a case per minute during a whole year (STJ, 2019).

At first sight, these facts emphasize the enormous litigiousness in the biggest Latin America country. However, it also highlights the problem regarding the management of a huge quantity of information. This is particularly important due to the fact that Brazil, since the 60's [1], though being a typical civil law system, attempts to attribute more relevance to judicial precedents (Carvalho, 2018). However, it so happens that an unstructured system of data suppresses the possibility of case law information, especially if, in this system, hundreds of thousands of lawsuits are decided monthly.

As it is humanly impossible to deal, manually, with such a huge amount of data, AI seems to be a very promising approach (Maia & Junquilho, 2018), particularly because it needs a great quantity of information to train algorithms (Sourdin, 2018) and also identify similarities (Datatilsynet, 2018). In Brazil, there are some current efforts being made to increase significantly the impact of AI in the judicial system. As an example of natural language processing (NLP) [2] technology, a robot named Victor is being developed to support the

Supremo Tribunal Federal (STF; Brazilian Supreme Court) in analyzing technical prerequisites. In its first phase of development, aimed at categorizing documents received by the STF by its type [3], it was able to classify, with more than 84% of accuracy, documents in less than a second each (Braz et al., 2018; Silva, 2018) [4].

Additionally, NLP offers a series of other resources that could successfully improve classification, organization, and research of decided cases and enhance Brazil's precedent system. In order to validate this argument, this draft was based on a review of pertinent literature and structured as follows: Section 2 exposes how Brazilian civil law system approached to common law institutes; Section 3 presents some tangible beneficial effects NLP could bring to the judicial system of this country; Subsection 3.1 displays some NLP techniques that could be applied regarding text analysis; Section 4 exposes some controversial points regarding AI application in law; and, at last, Section 5 analyzes if this model could be replicated in other systems that somehow attribute relevance to judicial precedents.

2 Brazil's precedent's system evolution

Ordinarily, civil law and common law tend to be understood as antagonistic systems of law. However, this is mere fiction, as both systems take reciprocal advantage of each other's fundamental basis. As exposed by Gascón (2015), in civil law systems, case law has a special role alongside legislation, and, on the other hand, in common law systems, legislation is not irrelevant. Case law relevance in civil law systems is related to fundamental law principles such as legal certainty, stability, coherence, equity, and impartiality. All of these principles underlie a case philosophy, as it presupposes that similar situations should have similar solutions, as they are meant to predict future situations. This is also known as formal equity and can be viewed as an application of Kant's principle of universality (Gascón, 2015). In addition, obedience to previous decisions might contribute to saving the court's time, which also enables them to focus on new and more complex situations (Gascón, 2015).

As explained in endnote 1, the first signal of Brazil's civil law system's convergence to common law precedents systems [5] was the advent of súmulas (summaries), a judicial institute created in 1963 [6]. From this point onwards, a series of procedural institutes were created to reinforce the mandatory observation of precedents and case law [7].

As a matter of fact, in 1973, a new procedural tool was created: an incident of jurisprudence uniformization was included in Brazil's Procedural Civil Code (articles 476 to 479) (Carvalho, 2018). In order to diminish hermeneutic divergences, judges of the Courts of Appeals could request the court's previews pronunciation. In 1988, with the advent of the Federal Republic's Constitution, the Superior Tribunal of Justice was created to reinforce the coherence of the interpretation of federal law (Carvalho, 2018), whilst the Supreme Court would be responsible for maintaining the coherence of constitutional law interpretation. In 1990, Federal Law 8.038 was promulgated and judges of the Superior Tribunal of Justice and of the Supreme Court were given the power to deny the admissibility of cases that contrasted with summaries (súmulas) of those tribunals (Carvalho, 2018). In 1993, an Amendment to the Constitution (Third Amendment) created an instrument of abstract judicial review that declares the constitutionality of a law (Carvalho, 2018). Decisions in these actions have *erga omnes* efficacy and bind the Judiciary, Legislative and Executive Powers. In 1995, Federal Law 9.139 extended the power to deny the admissibility of cases in contrast with summaries to Federal and State Courts of Appeals (Carvalho, 2018). In 1998, Federal Law 9.756 allowed judges to deny appeals if they contrasted also with the court's case law (Carvalho, 2018). In 1999, Federal

Law 9.868 prescribed that the Supreme Court decisions were to be observed by all the Judiciary branches (Carvalho, 2018). In 2004, the 45th Federal Constitutional Amendment created the binding summaries (Carvalho, 2018). It is also a summary of case law, but it is edited by the Supreme Court and binds all powers of government. In 2015, a new Civil Procedural Law Code was promulgated and established that all decisions should observe case law, precedents, and the summaries. This new code incorporated several typical common law institutes, such as distinguishing, overruling, and identification of *ration decidendi* and *obter dictum*. It also created a legal imposition for all judges and courts: all of them shall obey the Supreme Court decisions regarding concentrated judicial review and follow binding summaries of the Supreme Court, decisions in mass trials, non-binding summaries, and others special tribunals orientations.

As shown above, since the 1960s, judicial precedents are receiving more binding powers. However, a considerable portion of Brazilian judges refuse obeying precedents [8] from the Courts of Appeals, Superior Courts and Supreme Court, which demonstrates the challenges that can occur when different law systems traditions are approximated. Thus, it is impossible to construct a system of precedents until judges and institutions in charge of applying them follow at least their own precedents (Pulido & Bustamante, 2015). And it is also impossible if this huge amount of information is inaccessible. Artificial intelligence is one way to overpass this information asymmetry.

3 Natural Language Processing's Beneficial Effects on a Precedents System

In this context of a novel precedent system, NLP might, first, enable the retrieval of relevant information from and for all of the Judiciary. Judges would be capable to find if there is a precedent regarding a similar case being decided. Lawyers and public prosecutors would also have previous access to these cases and would be able to analyze if there are similarities. People in general would be able to foresee the Judiciary's position regarding some issues before suing (or being sued). Considering that predictability is inherent to the rule of law (Nunes, 2020), society's expectations would not be frustrated, which contributes to the consolidation of legal certainty.

Secondly, knowing that a precedent exists and must be followed would prevent a lottery jurisprudence, in which each case's interpretation varies according to the judges (Cambi, 2001). The lottery jurisprudence concept derives from the fact that it is not unusual that different judges adopt diverse conclusions, though being in the same jurisdiction area and judging perfectly similar cases. Thus, NLP would help creating jurisprudence coherence (Oliveira, 2020), ensuring due process of law and implementing the isonomy principle (Maia & Junquilho, 2018).

Thirdly, it would also diminish Judiciary costs in Courts of Appeals, Superior Tribunals and the Supreme Court, as those could simply deny judging lawsuits that contrasts the jurisprudence (Oliveira, 2020). It is important to emphasize that, since 2008, appeals to Brazil's Superior Courts (which comprehend especially the Supreme Court, responsible for judicial review, and Superior Tribunal of Justice, responsible for standardizing the federal law application) can be judged in mass via what was named as repetitive systematic. Thus, constant, numerous and identical controversies can be decided by one single decision that binds all tribunals and judges. To generate legal certainty and prevent dissident decisions, Superior Courts stay proceedings in the entire country concerning the law controversy until its final decision. In this context, AI may contribute not only to identifying similar cases, but also to effectively apply to them a previous biding decision, which is something that contributes to reducing costs and enables courts to focus on new and complex matters.

These aspects prove that AI indeed might be a force to promote social good [9], as long as it is shaped correctly (Hager et al., 2017) [10]. This phenomenon was named as AI4SG (AI for Social Good) and can be defined as the "design, development, and deployment of AI systems in ways that (i) prevent, mitigate or resolve problems adversely affecting human life and/or the wellbeing of the natural world, and/or (ii) enable socially preferable and/or environmentally sustainable (Floridi, 2007) developments" (Cowls, King, Tadeo & Floridi, 2020, p. 3). However, distortions in AI development are a real danger, as shown in Section 4.

3.1 NLP Applications in Case Law Systems

In order to effectively [10] improve precedent research tools (information retrieval tools), NPL can be applied in different manners, especially by indexation and sentiment analysis (SA). The indexation technique allows the algorithm to, first, identify the essential aspects of a document and, secondly, establish criteria of research (Savoy & Gaussier, 2010). By indexation, it is possible to insert the text information in categories that represent its content, such as a thesaurus (Câmara, 2007). Thus, the indexing process reorganizes information in order to create representations of the semantic content of documents (Savoy & Gaussier, 2010).

There are two main ways to identify the essential aspects of a document: per extraction or per attribution (Câmara, 2007). The technique per extraction obtains the essential terms from the own text, whereas the technique per attribution is far more complex and may tag text terms that are not literally in its content. The second technique is more useful in legal contexts, as it would be capable to identify the most relevant content of a lawsuit, discover relevant synonyms, and avoid useless out of context texts to be found, which is, normally, a big challenge in indexing per extraction technique. Finally, it is also possible to index a text via morphological parsers or even techniques of clustering (Câmara, 2007).

As a pragmatic example of indexation, we can picture the following situation. Is the Brazilian Supreme Court decides a leading case regarding constitutional fundamental principles, by indexation, it is possible to identify all the contenders, all judges that decided the case, all lawyers, all principles that were analyzed, the main theme that was judged and all the topics related to it. The user will be able to retrieve all that information, which enables the identification of repetitive parameters that might be useful not only to analyzing future cases, but also to understanding the court tendencies and preferences. Indexation, therefore, is an efficient way to summarize semantic information to subsequent retrieval. Adopting indexation via natural language processing enables research engines to go beyond research by mere literal terms, largely adopted in Brazil.

On the other hand, sentiment analysis is a type of technique that also involves linguistics, data processing, and machine learning (Silva, 2016). It aims to identify the polarity (positive, negative or neutral) of a text [11] by adopting a non-psychological referential [12]. It is particularly useful in obtaining a more accurate analysis of results. As demonstrated by Morais (2019), and Morais and Costa (2020), it can create a new criterion of research, that is able to identify lawsuits in which the central thesis was accepted or denied. The difference between sentiment analysis and indexation is the depth and range of analysis. Whilst sentiment analysis obtains deeper semantic information regarding the meaning of a text, indexation is capable of retrieving simpler and broader information that is useful to identify similarities in a text.

Nevertheless, both these techniques allow huge text data retrieval and would allow Superior Courts and the Supreme Court's precedents to be better known and obeyed in Brazil.

4 Critiques regarding Artificial Intelligence in Law

If not shaped correctly, we could end up with "good-AI-gone-bad" (Cowls et al., 2020), which could lead to severe social damages. Thus, AI designers need to face two main challenges regarding in unnecessary failures and accidental successes (Cowls et al., 2020). Regarding law and retrieval of case law information, an example of unnecessary failure would be the use of AI that is unable to identify similar cases, providing lawyers, judges, and citizens in general, totally inaccurate information. In this situation, legal uncertainty would increase significantly, discouraging the obedience to decisions from hierarchical superior tribunals and inhibiting jurisprudential cohesion. On the other hand, accidental success, in this area, would be the retrieval of relevant information by mere chance, which prevents the use of this technology in a repetitive manner (Cowls et al., 2020).

In order to avoid these scenarios, it is necessary to observe fundamental rights, especially in socially vulnerable contexts (Wright & Verity, 2020), and prevent biases (Maia & Junquilho, 2018; Wright & Verity, 2020). Thus, Cowls et al. (2020) established seven essential factors for successful Artificial Intelligence for Social Good: i) false reliability and incremental deployment, consistent in creating requirements to empirically test AI operational capability; in other words, a set of criterion to verify if the technology achieves its purpose; ii) safeguards against the manipulation of predictors: this topic is particularly relevant to prevent data manipulation; iii) receiver-contextualized intervention, which means that artificial intelligence must be capable of attending specific users' needs according to their context; iv) receiver-contextualized explanation and transparent purposes, meaning that users must know how the artificial intelligence algorithm works, as it is a matter of ethical principle; v) privacy protection and data subject consent: this factor is also related to transparency, as the user must know which data is being used and for what particular purpose; vi) situational fairness: in order to avoid biases, artificial intelligence developers must be able to maintain factors that are important for inclusiveness; each context will require a different approach; vii) human-friendly semanticization: artificial intelligence must not destroy people's ability to understand meaning.

Regarding retrieval of precedents via AI, all these factors are indispensable. The technology must be developed so that it could: enable the validation of the information obtained (first factor), that is, if it is capable to identify correctly every relevant legal element in both previous and new cases; prevent data manipulation towards certain judicial and political position (second factor), which could be made by ensuring the retrieval of all cases related to that one being judged, both favorable and unfavorable to the user's predetermined position [13]; attend specific users' needs (third factor), especially by conciliating its information demand and the information effectively retrieved; be transparent as much as possible (fourth and fifth factors), clarifying to society how information is treated and retrieved in order to obtain precise and unbiased results, and also in which way all the data available in lawsuits is being stored and used; observe equity (sixth factor), in order to retrieve precedents that adopt specific and non-usual solutions, especially those regarding vulnerable individuals, enabling them to be known and applied to extreme situations; and grant all users, especially judges, the capacity to evaluate the effective application of each precedent (seventh factor).

Floridi et al. (2018), established twenty recommendations that should be observed in order to minimize the possible risks regarding artificial intelligence, which enables it to be a true good for society. Those recommendations can be summarized in five major topics [14]: assessment (institutions should be able to: verify if AI systems reduce conflicts; which tasks cannot be delegated to AI systems; evaluate if current regulatory legislation about this issue is

grounded in ethics); development (institutions should: develop transparency parameters regarding the use of AI in socially significant decisions; develop legal procedures and IT mechanisms to audit AI systems in order to eliminate unintended results; and, at last, governments should create specific regulatory agencies to observe AI and protect the public welfare); incentivization (governments should incentivize financially the development and use of AI, especially by taking into account the ethical standards necessary to create socially positive innovation); and support (governments should develop regulatory standards and educational curricula that consider ethics parameters and the relevance of artificial intelligence).

Among these factors, another relevant aspect should be taken into account when applying artificial intelligence to law. As law is a field of knowledge that deals directly with material justice, an algorithm cannot substitute human judges. It lacks human compassion (Sourdin, 2018), for now. The same observation is valid to applying artificial intelligence to educational purposes. Algorithms cannot provide human interaction, which is somehow indispensable to the development of critical thinking (Rouhiainen, 2019).

Considering all things exposed above, natural language processing in law should be used as an accessory tool, such as a search engine that indicates valid and possible applied precedents to new cases, as proposed previously.

5 Final Considerations

It is only possible to create a system of precedents if, first of all, lawyers, judges and the public prosecutors can detect that a precedent actually exists. Awareness about how the law is applied, that is, what is prohibited or not, is essential to allow each citizen to shape their own behavior and avoid problems against the State or against other individuals, which would reduce the number of conflicts in society. It also guarantees effective isonomy and equity, as all identical controversies are going to have the exact same solution, with the exception of possible overruling. A legal system like the Brazilian one, with dozens of millions of lawsuits decided every year, inevitably needs help from technology in order to maintain jurisprudential coherence and legal certainty. And, consequently, the natural language processing of texts can contribute significantly to improving the case law system by organizing information and publicizing it. Several techniques may be used by Brazilian courts to improve precedent search engines, especially sentiment analysis and advanced indexation methods. However, it is mandatory that artificial intelligence in law observe certain ethical parameters in order to truly protect the public welfare. Furthermore, this technology must not substitute the courts' main activity, that is, the power to decide. Justice and equity need compassion that machines do not have. At least, not by now. Thereby, artificial intelligence in law must be an accessory tool that facilitates conflict resolution, and not a decision-making technique.

This technology may also be able to ensure coherence in other precedents systems, as long as the main source of information is also in written data and available through digital information systems. That being said, courts from all around the globe can use artificial intelligence to organize and make it easier for all their citizens to access information.

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Endnotes

[1] The notorious judicial event that marks the beginning of the approach between the Brazilian civil law system to a precedent system is the creation of an institute called *súmula*, which, literally, means *summary*. It was created by Brazil's Supreme Court Member, Minister (Justice) Victor Nunes Leal (Carvalho, 2018; Souza, 2006), and synthesizes, in a short formulation, the position of a court regarding some matter.

[2] Subarea of artificial intelligence that manages to process language information in a structured manner (Silva, 2016), allowing the analysis of a huge amount of information in a reduced processing time (Finatto, Lopes & Ciulla, 2015). It can be applied to written or non-written natural language. However, regarding precedents, its relevance is focused on written language.

[3] As Braz et al. showed (2018), each document was classified as: a) an appellate decision; b) an extraordinary appeal (appeal that is decided by the Supreme Court, and analysis of violations of the Brazilian Constitution); c) an extraordinary appeal bill/review; d) administrative orders; e) a decision; f) and other documents types.

[4] Sourdin (2018) establishes that there are three main ways technology can reshape judicial systems: a) as a supportive technology (assists informing and advising those who are involved

with the Judiciary); b) as a replacement technology (substitutes some activities made by humans before); and c) as a disruptive technology (significantly changes the way those involved with the Judiciary work). However, some technologies, like the robot Victor, may be classified in more than one single category at the same time. It functions as a supportive technology, as it is not entirely autonomous and does not have the power to classify each document without supervision. It is also a replacement technology, given the fact that more than 22,000 work hours are necessary to analyze and classify more than 42,000 lawsuits received by the court each semester (Braz et al., 2018). Potentially, the robot could substitute humans in this work. And, finally, it is also a disruptive technology, as, in its final phase, it may significantly increase the Brazilian Supreme Court's productivity and consolidate this court as the first in the world to use AI routinely in its essential activity and daily work (Silva, 2018).

[5] It is important to note that, in civil law systems, the primary source of law is the *written law*; there is a prevalence of norms (Oliveira, 2020). In common law systems, precedents are the primary expression of the law; the judges are *creators* of the law (Oliveira, 2020).

[6] Actually, some areas of Brazilian law are prevailingly based on case law since its origins, such as electoral law (Carvalho, 2018).

[7] In this context, jurisprudence, or case law, means "the homogeneous application of judicial dispositions by a court or multiple courts" (Nader, 2013) and also the prevailing interpretation of some judicial question or legal text by the courts (Oliveira, 2020).

[8] The Brazilian Judges Association demonstrated that more than half of interviewed judges claim that, besides legal obligation, they are not obliged to apply the jurisprudence or binding precedents (Associação dos Magistrados do Brasil [AMB], 2018). Even some Court of Appeals do not obey superior precedents. As an example, Judges (Ministers) of the Superior Tribunal of Justice, more than once, publicly stated that São Paulo Court of Appeals generates a systemic disorder in Brazil's Judiciary (Martines, 2018).

[9] In other contexts, can improve the allocation of urban resources (Hager et al., 2017); the educational system (AI Rouhiainen, 2019; Zeide, 2019); the public security systems (Hager et al., 2017) and other.

[10] Effectiveness, in this context, means an algorithm that is able to precisely identify the researcher needs and the document that fulfil that necessities (Câmara, 2001).

[11] Actually, sentiment analysis is made in different levels or granularities levels (Morais & Costa, 2020; Morais, 2019): a) the level of document, in which a polarity is attributed to a whole text; b) the level of sentence, in which a polarity is attributed to a sentence from the text; and c) the level of aspects or entities, in which a polarity is attributed to a component of the sentences (words).

[12] Sentiment analysis is far different from opinion mining. Opinion mining aims to identify if a text contains an opinion, which involves an analysis of subjectivity and requires an individual that has psychological attributes (Silva, 2016).

[13] Though it seems to be technically imprecise to state the existence of favorable and unfavorable judged cases regarding the same matter, in Brazil's judicial system it is common that superior courts and local tribunals adopt conflicting positions about the exact same issue. Thus, there is too little internal coherence. In this context of extreme disorder in both vertical and horizontal precedents, natural language processing would contribute to generate coherence, as users would have access to a broad spectrum of precedents and challenge tribunals to straightly justify the adoption of conflicting positions to similar cases.

[14] Floridi et al. (2018) established these recommendations in European context. However, due to its universal nature, it is possible to extend them to others continents as well. As a matter of fact, Brazil's Judiciary incorporated in 2020, via Resolution Number 332 from Conselho Nacional de Justiça (CNJ; Justice National Concil; the authority responsible for administrative matters in all national Justice), a significant portion of these recommendations regarding the development of artificial intelligence for judicial purposes. For instance, CNJ established that AI developers obligatorily have to observe fundamental rights, transparency, impartiality, auditability, ethics, and utilize technology in order to diminish social injustice.