Artificial Intelligence Approaches within the Brazilian Judiciary's Contemporary Jurisdictional Model

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Abstract

The present work aims to analyze the methods of approaching Artificial Intelligence for use as a decision support system in the Brazilian Judiciary. Among the factors for the choice is the Brazilian jurisdiction system, which was originally civil law and in recent times has absorbed common law characteristics. Likewise, it analyzes whether a tool would be necessary for each judge to preserve their discretion or if the tool would be uniformly differentiated only on account of the matter dealt with; thus, are presented the characteristics of classic jurisdiction systems and Stare Decisis Brasiliensis, notions and approaches of artificial intelligence, in order to identify which approach methods would be most appropriate for the Brazilian Judiciary. The descriptive method is used, supported by interdisciplinary literature (legal and computational) of national and foreign reference.

Keywords

Brazilian Precedent System, Artificial Intelligence Approaches, Intelligent Decision Support System

1. Introduction

In view of the current technological scenario with serial disruptive processes of electronic and digital innovations, promoting successive changes altering the development patterns of activities within and outside the State, the Judiciary's interest in the use of computational mechanisms arose, seeking to provide greater speed to the judicial process, effectiveness, efficiency, and compliance.

This interest is also due to the high Judiciary's congestion rates which, as a result of increasing litigation, have generated an accumulation of cases whose

elimination or reduction would hardly be possible to solve relying only on the number of servers available in its staff.

Among the available technologies, Artificial Intelligence (AI) has been the most attractive because of its ability to solve complex problems by finding correlations and patterns in a large body of data and at high speed. The high potential of AI even makes it possible to build a system with decision-making autonomy, that is, one that can make decisions without prior human validation.

However, in accordance with National Council of Justice (CNJ) Resolution n. 332/2020, the Judiciary cannot use AI models with decisional autonomy, that is, only those that depend on human validation by a competent authority are allowed, thus, the AI decision is taken as a suggestion to the effective decision maker (judge).

The AI system to support the judicial decision can be developed using empirical methodology of past cases (Data driven) or based on explicitly pre-set rules (Model driven) (Muller, Buarque, & Marwala, 2022: p. 3.4.1). If the case-by-case method (Data driven) is chosen, it is still necessary to analyze whether an AI model will be trained customized by magistrate, based on their own previous judgments to maintain the democratic capillarization of wills or, oppositely, whether a uniform AI model will be developed by matter competence to keep the jurisprudence stable, complete, and coherent.

In other words, should intelligent decision support systems replicate previous decisions (subjectivities) of the judge while maintaining his freedom and discretion or seek greater uniformity in judicial decisions respecting superior judicial precedents since Brazilian's judicial system is hierarchically organized?

In order to respond, it is necessary to reflect on Brazilian's jurisdictional system, since, after the changes brought by the 2015 Civil Procedure Code, enhancing the dominant or precedent jurisprudence, it is crucial to clarify whether the legal regime in Brazil remains centered on the law (civil law) or if it is hybrid, influenced by the common law, seeking a uniform interpretation of laws and, consequently, uniform judgments.

In this regard, several contemporary, contradictory interpretations applicable to similar cases for the same legal text would end up denying the idea of legal certainty, equality and, consequently, the ideal of justice.

Without intending to exhaust the subject, these are the questions that this article intends to answer to contribute to the choice of the best approach for AI models to support judicial decisions that can be used in Brazilian's Judiciary.

From the methodological point of view, the descriptive method will be used, supported by interdisciplinary literature (legal and computational) national and foreign.

2. Classic Jurisdiction System Models: Civil Law and Common Law

Civil Law consists on Roman-Germanic law family originated in continental Europe and dispersed throughout the world due in part to colonization. Despite

its origins during the Roman Empire, it had great notoriety from the 18th century onwards, especially after the French Revolution, which intended to put an end to absolutist discretion and brought the idea of powers separation in which "the popular will is now considered the only onslaught of legitimacy" (Tucci, 2021: p. 124).

In this sense, the monopoly of law by the legislature was highlighted, since the main source would be the law, which should not seek solutions for all concrete situations, but should formulate sufficiently general rules that would allow judges to easily deduce how a given case would be resolved. Thus emerged the positivism widely spread by one of its most influential supporters, Kelsen (2006: p. 52) embodied in the pure theory of law with an anti-ideological tendency disconnected from morality.

Therefore, the main foundation of legalistic positivism is security in the law based on a mechanical syllogistic process of interpretation, reducing the role of the judge to a mere enforcer of the law of a declarative nature only. Thus, doomed to be overcome, the "purely formalist technicality of Law adopted by positivism led to a split between fact and value, between logic and ethics" with "inversion of legal values allowed by the use of Law itself" (Pimentel, 2014).

This is because, without attributing value, the judicial decision would boil down to the legalistic positivism of law cold interpretation without any adaptation to reality and uncompromised with the prevailing socioeconomic values that once allowed the spread of Nazism.

Thereby, after 2nd World War, the judicial function ceased to be merely declarative, as in the past, and became one of valuation, attributing meanings to elements of the legal text in a motivated way, "transforming the decision, thus, of discovering the norm contained in the law, in a kind of argumentative practice aimed at making the attribution of meaning to the text acceptable" (Marinoni, 2020).

That said, "reasonability is used as a guideline that requires the relationship between general norms and the individualities of the concrete case" (Ávila, 2016: p. 195) and, therefore, the interpretation activity would, in fact, be a reconstruction, incorporating axiological connections to the text, the binding of norms legal relations with the world they refer to.

Brazil, influenced by Portuguese colonization, originally adopted the Roman-Germanic model of Civil Law, whose main source of law consists of written law.

On the other hand, there is common law which, in principle, consisted of customary law applied in England, based on everyday practice, which gradually disappeared and gave way to jurisprudential law. The little influence of the ius romanorum may be explained by the fact that the common law in England had been established even before the spread of Roman-canon law in Europe, as well as by the "legal unity, geographical configuration, judicial centralization and the homogeneity of forensics class" (Tucci, 2021: p. 95).

At that time in England, judicial decisions were handed down by the king and judges, who had no commitment to any written text, and would be cataloged over the years in statute books as court customs. From the 19th century, the rule of precedent is perfected, recognizing its binding effectiveness, mainly because English parliament would arrogate to itself the power to change the law and legislate with authority if the judiciary was not obliged to follow the law declared in its own decisions. In this way, the modern theory of common law is represented by the Latin expression "stare decisis et non quieta movere" which translated means "keep the decision and do not disturb what has been decided" linked to the principle of mandatory precedent.

Furthermore, in this "open system", it is up to the judge to decide without written essential legal rules, because, in fact, starting from the "legal rules" already established (precedents), the judge will discover the "legal rule", perhaps new, which should be applied to the concrete case considering the reasons to distinguish the present situation from the one presented in the past.

Therefore, the application of the rule of precedent demands analysis of judicial decisions, since, in the reasons given by the judges, one must distinguish the necessary support for the decision, the ratio decidendi, which is incorporated into the law as a rule and must be followed in the future, differentiating it from the obiter dictum, which are others adjacent points without much relevance and which will only have a value of persuasion. The ratio decidendi is not pointed out by the judging body of the precedent itself, but, later, judges will abstract from the case the legal command of general scope in an inductive mental process from the particular to the general.

However, due to law evolution within social dynamics, the replacement of a certain precedent is allowed because it is considered outdated or mistaken (overruling), and the judge can identify that the concrete case presents different situations that must be decided based on a different legal rule (distinguishing). It is worth mentioning that, when faced with a case that had not yet been analyzed by the courts, the English judge should consider it as a hard case, not supported by the precedents contained in the Law Reports and decide it using other sources of law.

There is a tendency to form a complementary system of rules prescribed by the legislator in certain matters, but the Judiciary would still control the application of the new laws, since "the true rule of law only exists seen through the facts of a concrete kind and reduced to the dimension necessary for the resolution of a dispute" (David, 2002: p. 435).

Despite English colonization, the United States followed the British experience only until the enactment of the Constitution in 1787, when it established as sources of law the constitution, federal and state ordinary laws, and, in a subsidiary manner, inherited common law rules to fulfill gaps in written laws.

In summary, Civil Law systems are based on comprehensive sets of written laws and codes that aim to cover all areas of law providing a systematic and ac-

cessible legal framework. However, the clarity and predictability of Civil Law may imply rigidity that could hinder adaptability and responsiveness to new legal challenges.

In other hand, Common Law systems are praised for their flexibility and adaptability, allowing laws to evolve with society, but it can be complex and unpredictable due to its reliance on an extensive body of case law.

Therefore, both systems have their strengths and weaknesses, and the choice between them often reflects historical, cultural, and societal values. Some countries, recognizing the benefits of both, have blended elements of both systems to suit their unique legal and cultural landscapes.

3. Brazilian's Precedents System; the Stare Decisis Brasiliensis

Brazil's legal system is rooted in the civil law tradition, having its framework based on codes and statutes, particularly the Federal Constitution of 1988, which is the supreme law of the land.

So, the Brazilian legal system is characterized by its complexity, with numerous laws, codes, and regulations that sometimes overlap or contradict each other that can lead to uncertainty and unpredictability.

In recent times, there has been a global trend of merging legal systems with the granting of greater jurisprudential space to systems that were traditionally civil law.

In Brazil, it has been noticed for a long time the growing importance of the court's jurisprudence, especially superiors, used in the reasoning of decisions pronounced by the Judiciary bodies. So much that, in 1993, Constitutional Amendment n° 3 established the effectiveness erga omnes and definitive decisions binding effect on the merits handed down by the Federal Supreme Court in declaratory actions of constitutionality of a law or normative act by inserting in 1988 Constitutional the §2, and later, through Constitutional Amendment No. 45, not only changed the text of the aforementioned device to extend the scope of such effects to the decision-making pronouncements of the Brazilian Supreme Court in direct actions of unconstitutionality, and also affirmed the binding precedent of the Federal Supreme Court, also effective erga omnes and with mandatory application by judicial bodies and the Public Administration.

In the same sense, in 2015, with the edition of the contemporary Code of Civil Procedure (CPC), the Brazilian legal system emerged with the structuring of mandatory judicial precedents system, with some similarities, but in no way identical to the stare decisis systems existing in the United States and in the UK. Founded on guidelines established in articles 926 and 927 of the CPC, the Brazilian model of judicial precedents established its justification in the need to provide legal security to society and rescue Judiciary legitimacy that until then was marked by the diversity of pronouncements on contentious repetitive issues, leading the jurisdiction to a state of perplexity for being faced with an "anarchic"

jurisdictional reality producing a "lottery" jurisprudence, in which it was common to witness a judge pronounce in a totally antagonistic way to that decided by other colleagues and by the superior courts in identical cases, in total lack of harmony with previous judgments, without pointing out the existence of an eventual distinction (distinguishing) or even the possible overcoming of the corresponding understanding (overruling), justifying such freedom to decide in a supposedly absolute "judicial independence".

The launching of the structure of a stare decisis brasiliensis by the 2015 CPC, however, promoted a series of changes in the national judicature. Brazil now has elements of civil law and common law in its procedural legislation, making it a system of a hybrid nature, transposing itself "directly to the constitutional paradigm that combines, at the same time, liberal rights and social rights, individual rights and collective rights, public law and private law, in the pluralist matrix of the Constitutional Democratic State" (Zaneti, 2015).

For Robert Alexy (2001: p. 258/259), "a theory of argumentation that fails to take into account the rule of precedents would lose one of the most characteristic aspects of legal argumentation" in the view of universalizability principle so that similar cases are equally treated.

In these terms, the Supreme Court would have the function of conferring unity to law, defining an adequate and stable meaning to the legal text in face of factual circumstances and historical moment in accordance with the evolution of social needs, not only to guarantee uniformity in the application of the law, but to preserve equality before the law.

In this context, article 926 of CPC prescribes the courts general duties related to the construction and maintenance of a precedents system in order to maintain uniform, stable, integral and coherent jurisprudence as a result of constitutional precepts such as the duty of motivation, the principle of contradictory, principle of equality and legal certainty.

However, it is important to distinguish jurisprudence from precedent, the first being a set of converging decisions that do not have a binding effect and, differently, the precedent is all court decisions capable of producing a ratio decidendi that will serve as a paradigm for future cases that fall within the same context.

In this way, the ratio decidendi consists on the legal thesis essence sufficient to decide the concrete case (the decision logical-legal reasoning) and reveals itself as rationally acceptable argumentation endowed with universality.

In the stare decisis brasiliensis structured in article 927 of CPC, precedents can be binding (with high mandatory density), relatively binding (merely mandatory, but with low mandatory density, being of intermediate effectiveness) or persuasive.

The binding precedents are those listed in items I to III of article 927 of the CPC, covering the decisions arising from the exercise of concentrated control of constitutionality by the Supreme Court, the binding precedents of the Brazilian Supreme Court, and the theses arising from the mechanisms of concentrated

formation of precedents, the incident of resolution of repetitive demands (IRDR), the incident of assumption of competence (IAC) and the judgment of repetitive appeals. They are called precedents of a normative nature, in view of their generality and mandatory applicability to all similar cases, as well as the possibility of filing a Complaint in the face of possible non-compliance, in accordance with article 988, items III and IV and §5, of the aforementioned civil procedural law.

Relatively binding or merely obligatory precedents are those of lower obligational density, that is, of intermediate effectiveness. They are marked by a lower obligation because, despite being listed as mandatory, their non-compliance by the judge does not challenge the Complaint disciplined by articles 988 et seq. of the CPC. These are the precedents listed in items IV and V of article 927 of the civil procedural album, corresponding to the common summaries of the Federal Supreme Court in constitutional matters and of the Superior Court of Justice in infraconstitutional matters, as well as the guidelines arising from the full and special bodies of the Court to which the corresponding judge belongs. The mandatory density of these precedents, therefore, is lower compared to the binding precedents of the first three items of Article 927, considering that the former do not directly fit the claims of claims as an instrument to ensure compliance with the latter.

The other precedents, in turn, are called precedents of persuasive effectiveness, since they can be used as a paradigm for similar cases in order to influence the judge, although they are not effective beyond the parts of the res judicata, they do not bind the other bodies of the Judiciary and are not subject to Complaint. They correspond to other judgments, not covered by the list of article 927 of the CPC, but which can serve as support and parameter for the judge when justifying his decision.

Even so, if the precedent of persuasive effectiveness is repeatedly referenced, it can be considered jurisprudence contributing to contradictory decisions reduction and giving the law unity, conformity, stability and coherence.

Some critics of the precedents system argue that it could stiffen the system, but, on the contrary, faster than the legislator, the judiciary can follow changes in society over time in order not to make the law obsolete and inapplicable.

This is due to art. 489, §1˚ VI of the CPC that obliges any judicial decision that intends to modify or not apply precedent to demonstrate the existence of distinction in the case under judgment or the overcoming of the understanding and, therefore, the non-observance of such rule will configure the decision as not based on confrontation with the rule of art. 93, IX of Federal Constitutional (CF).

This obligation stems from the principle of argumentative inertia, which establishes a strong argumentative burden on anyone who intends to remove the precedent by distinguishing or overcoming it in the face of a similar case and, consequently, would need less argumentative burden for those who intend to

apply the precedent, simply identifying the determining grounds for demonstrate that the case falls within the grounds of the invoked precedent. Argumentative inertia aims at preserving the status quo, demanding extra reasons not yet presented or faced for the departure from precedent and is implicitly enshrined in the Constitution through equal treatment for related cases (art. 5, caput, CF), adequate motivation (art. 93, IX, CF) and the contradictory as the right of the party to know the judicial motivation for the purpose of impugnation (art. 5˚, LV, CF).

It is based on the precedents system, with recognition of their binding or persuasive effectiveness, which "the recommended temperament occurs between the requirements of certainty and reliability with the requirements of legal flexibility and adaptation and mutation caused by the dynamics of social life" (Gouveia & Breirenbach, 2015).

Brazilian courts are notorious for their backlog of cases, which leads to slow judicial processes. This inefficiency affects the overall effectiveness of the legal system, causing delays in the resolution of disputes and the enforcement of rights.

Therefore, these reforms are an effort toward achieving a more efficient, equitable, and functional legal system in Brazil.

4. Artificial Intelligence - Concepts and Learning

The National Council of Justice (CNJ) defines Artificial Intelligence (AI) as "a set of data and computational algorithms, conceived from mathematical models, whose objective is to offer intelligent results, associated or comparable to certain aspects of thought, knowledge or human activity" (CNJ, 2020b).

The OECD - Organization for Economic Cooperation and Development (2019) conceptualizes AI as a system that, for a set of definitions and objectives given by humans, can make predictions, recommendations or make decisions in real or virtual environments, that is, they are designed to operate with various levels of autonomy.

AI can interpret situations in a body of data, it can find correlations and show patterns or phenomena at high speed, or it can manifest decisional autonomy without prior human validation (Sadin, 2019). Therefore, unlike simple automation, AI needs a training phase so that the system learns to solve the proposed problems.

The intelligent system training can occur through a casuistic empirical approach focused on data (Data driven) or rationalist driven by the syllogistic logic introduced in the model (Model driven).

In the rationalist method, deductive reasoning is used, which presupposes a logical derivation from prior knowledge (rule) from which the conclusion is inferred, through a general premise.

Differently, in the empiricist method, there is reasoning by induction and abduction. The inductive methodology extracts conclusions from a set of observa-

tions (data) and not from premises, that is, a generalizable conclusion and probalistic reasoning are inferred through particular cases (examples).

Abduction, on the other hand, seeks a causal relationship, the best explanation for a given event, establishing a probability that the conclusion was caused by a given premise.

Thus, an example of deductive training is classic AI based on rules or knowledge, also known as "if-then" models, when the system is trained solely with predetermined rules that result in outputs that are also predefined, that is, they perform the proposed tasks as explicitly described, but also "can quickly achieve competence by being informed or by acquiring new knowledge about the environment and can adapt to changes in the environment by updating relevant knowledge" (Russell & Norvig, 2013: p. 285).

Within the category of rule-based systems there are expert systems that make extensive use of specialized knowledge to solve specific and complex problems, just like a human expert. An expert system can deal with rigid areas such as law, but it requires a lot of knowledge and expertise in the heuristics involved in applying legal rules to specific facts (Ashley, 2017: p. 8).

On the other hand, there is training by induction and abduction, based on data, which extract general rules or explanations, respectively, from individual observations to find the one that best agrees with examples such as machine learning techniques.

Thus, machine learning is an area of AI that provides the ability for a system to learn through experience (data and observations) without being explicitly programmed in its code, as well as adjusting itself according to the knowledge acquired without human intervention. The main categories of learning in machine learning are: supervised, unsupervised and reinforcement.

In the case of supervised learning, input and output pairs are provided to the system and its objective is to find the function that transforms input into output to predict the future, that is, the "supervisor" provides examples to the system that, from them, will extract rules and knowledge to apply in new situations not foreseen in the examples.

Distinctly, in unsupervised learning no explicit output instruction is provided, the system learns based on patterns/similarities that it detects in the inputs provided without an "instructor" to correct the responses and is generally used for groupings.

In reinforcement learning, teaching is continuous and, similarly to unsupervised learning, the system only receives inputs, however, because of system decisions, outputs are accompanied by information such as rewards for successes and punishments for errors in a kind of trial and error. Thus, the system learns that the best solution (output) for the problem will be the one that confers the greatest reward.

There are also hybrid cases such as semi-supervised learning in which few pairs of input and output are provided, which may be imprecise, and some in-

puts without outputs, so the system acquires knowledge by observing examples even with "noise" and by identifying standards (Russell & Norvig, 2013: p. 808).

One of the most recent machine learning approaches is deep learning, a technique most used by Deep Neural Networks that simulate the human nervous system. It can use the supervised route or not and needs a lot of data (examples), but what differs it from other approaches is the ability to detect patterns in the data through connections in deep intermediate layers without the need for human intervention at this stage.

Typically, deep learning techniques are associated with opacity or the term black box for the way they self-adjust and weight inputs to improve the accuracy of their predictions. This characteristic consists in the fact that the internal functioning and logic undertaken in the system are obscure (non-transparent) or inaccessible to human understanding (Leslie, 2019).

Although it is not the focus of this article, it is worth briefly addressing it and highlighting that, to circumvent this problem, studies were developed on explainable artificial intelligence systems, such as the American research program "Explainable Artificial Intelligence (XAI)" (Darpa, 2016) which proposes to explain how the tool arrived at the decision and assist in human interpretation.

Thus, explainability can be conceptualized as the ability to explain the output generated by AI regarding the factors used for the decision, as well as the relative weight of these factors (relevance between them) (Doshi-Velez & Kortz, 2017). This characteristic is more related to complementary explanatory tools (post-hoc) making it possible to explain an eminently opaque technique.

In contrast, transparency is linked to the intrinsic capacity of the AI to be understandable to humans in terms of its operation without the need to explain its internal structure or the algorithmic means by which the model processes data internally (interpretable by design). The techniques that have such quality are: Linear regression, logistic regression, decision trees, k-nearest neighbors, rule-based, generalized additive model and Bayesian models (Barredo Arrieta et al., 2020).

Currently, both the European General Data Protection Regulation (GDPR) (União Europeia, 2016) and the Brazilian General Data Protection Law (LGPD) (Brasil, 2018) do not impose transparency on AI tools, but only in cases of decisions automated (without human intervention), the need to provide "useful information regarding the underlying logic" (art. 13 GDPR) or "clear and adequate information regarding the criteria and procedures used" (art. 20 LGPD).

Thus, there would be no express ban on opaque AI techniques in situations of semi-automated decisions (with human intervention), as well as in automated decisions if it is possible to explain their decisions through complementary XAI tools.

Despite this, it is extremely important to advance, mainly due to the focus of this work, that the CNJ, in Resolution nº 332 article 8º, VI, imposes "provision of satisfactory and auditable explanation by human authority regarding any pro-

posed decision presented by the Artificial Intelligence model, especially when this is of a judicial nature", as well as, as already discussed in the introduction, it does not allow autonomous AI forcing the competent authority oversight (articles 17, 18 and 19).

Thus, Brazilian's Judiciary may use implicitly interpretable or even more complex techniques as long as they observe "as a preponderant criterion for defining the technique used, the explanation of the steps that led to the result" (article 19), not prohibiting, then, the use of complementary XAI tools to confer explainability.

It is not intended to deepen the theme because the analysis criterion chosen by this article was the Brazilian jurisdictional system, but it is worth at least pointing out the existence of other equally important aspects to the choice of AI approach techniques for the Brazilian Judiciary, such as the explainability and representativeness of the trained data to mitigate discriminatory biases.

5. Learning Approaches × Brazilian Judiciary

AI's influence on the Brazilian judiciary is growing, reflecting broader global trends in the legal sector. The adoption of AI and technology within the judiciary aims to enhance efficiency, transparency, and access to justice, though it also brings challenges and ethical considerations.

Aiming at modernizing the Judiciary and implementing technological tools, the CNJ (2020a), through Res. 331/2020, established the National Database of the Judiciary Power (DataJud) which should contain procedural data and metadata related to all processes which made it possible to consolidate procedural bases through the Codex, an extraction tool, treatment and indexing of procedural documents that may become an input for the construction of AI models aimed at judicial provision.

This structuring of procedural data has made the Judiciary a very favorable environment for the implementation of machine learning, mainly in view of the large concentration of data, great demand for agility in judicial provision, budget availability to implement innovative solutions and human resources shortage to meet the workload (Boeing & Rosa, 2020: p. 92).

AI technologies enable faster and more comprehensive legal research by analyzing vast databases of legal documents, case law, and precedents, so this capability supports judges in identifying relevant past decisions, leading to more informed and consistent rulings. AI-driven tools can quickly sift through legal texts to find pertinent information, which is particularly useful in a system like Brazil's, where high volumes of cases can make manual research cumbersome.

It is important to highlight that, in article 2nd and 5th of Res. 332/2020, the CNJ has as a primary objective of the use of AI systems in the Judiciary the equitable provision of jurisdiction, that is, guaranteeing legal certainty and equal treatment to absolutely equal cases. Articles 17 and 19 of the same resolution stipulate that the outputs of AI systems to support the judicial decision must be

subject to review by the magistrate, as well as that there is no link whatsoever to the solution presented by the tool.

This means that the CNJ does not authorize, at least for the time being, the use in the Judiciary of AI systems with decision-making autonomy (judge-robot), that is, only support tools are allowed, whose output will be only a suggestion of a judicial decision that the magistrate may or may not accept in whole or in part. Thus, the intelligent decision support system would be a kind of Robot-Rapporteur able to select similar documents, "differentiating, in each procedural piece, what refers to the description of facts, legal texts, collated jurisprudence and argumentative structures", fitting to the judge "to review some points and verify information" before signing the decision.

Thus, it would then be an intelligent decision support system (IDSS), a very useful tool in areas where human judgment is needed, and which involve risks if the information provided to the decision maker is incomplete or uncertain (Blair, Debenham, & Edwards, 1997).

A decision support system increases user competence, complements human knowledge management skills, "accepts, stores, uses, receives and presents knowledge relevant to the decisions being taken" (Zeleznikow, 2004).

This is because decision support systems are semi-automatic or hybrid tools in which the human and the machine interact (human in the loop). The human has full decision-making autonomy but is subsidized by the collection of information or recommendations through the AI tool and, thus, maintains human autonomy and accountability as a measure of protection and quality control (Enarsson, Enqvist, & Naarttijärvi, 2021).

While AI is not making decisions in court, it supports the decision-making process by providing judges with comprehensive data analysis and insights that were not as easily accessible before. This can contribute to more informed and equitable decisions, though it also raises questions about the balance between human judgment and machine-generated recommendations.

As for approach techniques, rule-based (deductive) reasoning is the predominant basis for legal decision support systems, and tends to remain so to codify legislation, especially when there is a growing demand for more transparency and consistency in decision-making in public sphere, together with the continuous creation of laws, mainly in civil law countries. However, mainly due to questions of open texture and ambiguity, it is necessary to also include empirical techniques to compare with examples and give greater assertiveness to the terms in question, examples that can be selected specific cases, jurisprudence or even precedents, giving greater persuasion to arguments (Branting, 2017).

Since 1989, Bain has developed a hybrid approach combining rule-based and case-based AI. However, the program started with several heuristics for judicial decision-making and no concrete example cases, but after a few judged sentences, the system remembered its own cases and began to modify the strategies associated with them to form new sentences (Tata, 1998).

The use of case-based techniques is important because a case example is a piece of contextualized knowledge that represents a previous experience and teaches how to reach the reasoner's objectives; however it is necessary to differentiate the common cases from the precedents. The precedents, individually, will have an immediate propagating effect on the next cases, while common cases, when repeated, will have a cumulative effect and only noticeable in the long term (Hassan & Filippi, 2017).

Rodrigues (2021) criticizes the AI when it does not establish qualitative weights between the previous cases used in the system training to assist in the comparative analysis (analogy) with the current case and, thus, suggest the most appropriate decision. To overcome this situation, John Zeleznikow (2004) recommends that decision support systems should use mandatory precedents as norms or rules and that "common cases can be used to learn how judges exercise discretion".

Branting (2017) points out that data-centric approaches are better used in a hybrid way, together with rule-based techniques, to improve the understandability of legal texts than employed as preponderant components of an opaque system (black-box).

Another task that the decision support system can perform is the prediction which, in short, in the same way as performed by humans, consists of analyzing past data to predict a future result. This task is popular in data-centric techniques, such as machine learning, because it can be easily framed as a classification or regression task, which many techniques have available and accessible, as they basically require a set of examples of case/outcome pairs and, depending on the technique used according to the previous topic, can be intrinsically interpretable.

"Classifying an object means assigning it a label, called class, according to the category to which it belongs" (De Castro & Ferrari, 2016: p. 335) such as, for example, identifying a particular case inserted in the system entry as upheld, unfounded, or partially upheld based on the rules and example cases learned in the training. Examples of classification algorithms are: logistic regression, decision tree, random forest, XG Boost, Naive Bayes, Support Verctor Machines, Artificial Neural Networks, among others.

Just as an example, the PROLEXS system was created to act on the Dutch tenancy legislation and operates with four knowledge groups, each with its knowledge representation language and inference engine, thus uniting a rule-based system for the legislation and a case-based system for legal knowledge, expertise and case law. In case selection, case abstraction, and credit assignment, PROLEXS uses neural networks, and conclusions derived from a body of knowledge are written on a blackboard and made available to all other inference engines in the system (Zeleznikow, 2004).

Thus, just like the Brazilian jurisdictional system, for legal analysis and prediction, it is interesting to combine the two approaches (deductive and induc-

tive) as integrated subsystems, each with its specific task and technique, since they can be effective for understanding the bases of legal texts, as well as suggesting effective arguments and recommending decision drafts.

At another moment, since the intelligent judicial decision support system, in the current national context, is a mere draft decision suggested to the magistrate, would it be pertinent to use a customized tool with the data of common cases of each judge or a tool with uniform data of jurisprudence of the courts?

Tavares-Pereira (2009) understands that, to preserve the diversity of the enriching vision of law, an AI system should be trained per judge, with learning being individualized with the examples of each one, such as Luhmann's second-order observers that involve a kind of cloning of the judge's observation scheme. Otherwise, the standardization of decisions resulting from the use of general AI systems could tend towards totalitarianism and be incompatible with a strong democracy of "capillarized capture of wills" with the improvement of control mechanisms from bottom to top.

However, the draft decision rendered by the decision support system does not oblige the magistrate to decide according to the suggestion, being able to modify it in whole or in part, maintaining its functional "freedom". It is worth noting that, with the system of precedents, judges became less free and more responsible for decisions, as it is a "method of binding the judge's discretion in interpreting the law, controlling his authority in a democratic way, having as a parameter the universalization of the decision for future cases" (Zaneti, 2015). This "freedom" restriction is also since the non-observance of mandatory precedents, allows the proposal of Complaint by the interested party or the Public Ministry before the competent court (article 988 of CPC).

For Brito and Fernandes (2020), the objective of the precedents system adopted by the current CPC, would justify the use of a tool to support the uniform judicial decision, since it would precisely allow achieving in a simplified way the purpose of integrity and coherence of the jurisprudence, recommended by article 926 of CPC.

Even though that the decision support system could be uniform for judges, nothing prevents that from its use it could be calibrated according to user preferences, that is, "accepting" or changing the suggested decision drafts (output) will serve as a performance evaluation (implicit feedback) that can be incorporated into the system for better adaptation to users (personalization) (Google Pair, 2019).

In this way, the incorporation of feedback would complete the cybernetic arc as feedback from the system to follow changes in the environment more faithfully since the correction signal coming from this arc tends to approximate the suggestions pointed out by the system of the real decisions of the magistrate (Davi, Silveira, & Lima Neto, 2014). Even so, when users have their evaluations (feedback) integrated into the system, they will have greater confidence in the tool due to the degree of control conferred, as well as the personalization of the

experience.

Likewise, it is the proposal of Mendes, da Rosa and da Rosa (2019) who, through a Multicriteria Decision Aid Test Methodology - Constructivist, suggest the construction of a tool to support the judicial decision with calibration of the system by the magistrate himself preserving their subjectivities, a characteristic that would no longer have a negative connotation and would integrate the optimization of the system.

With use, the system may suggest decision drafts that the magistrate/user will not be able to distinguish whether it was prepared by him/herself (human) or not, as a "legal Turing test" (Valentini, 2017).

On the other hand, Boeing and da Rosa (2020) criticize the fact that, with the improvement of the intelligent judicial decision support system, the judge would accept the suggestion of the tool uncritically, giving up the function and the decision-making process may become just a kind of "delivery channel" for decisions generated by robots.

The integration of AI into the judiciary also entails significant challenges, including concerns about bias, transparency, and accountability. Ensuring that AI systems are developed and used in ways that uphold legal standards and protect individual rights is crucial. Moreover, there is an ongoing need for legal professionals to understand and engage with these technologies to harness their benefits effectively while mitigating potential risks.

6. Conclusion

This article aimed to answer which would be the most suitable method of Artificial Intelligence approach for use as a decision support system in the Judiciary, based on rules or data, having as a criterion for analysis the Brazilian jurisdictional system, which was originally civil law and in recent times had absorbed features of common law, as well as whether a customized tool for each judge would be relevant to preserve its discretion or whether the tool would be uniformly differentiated solely on account of the subject matter.

Despite not being the focus of this article, it is worth highlighting the existence of other equally important aspects when choosing AI approach techniques for the Brazilian Judiciary, such as the explainability and representativeness of the trained data to mitigate discriminatory biases.

From the analysis of AI approaches in supporting judicial decisions, it became clear that, in view of the Brazilian hybrid jurisdiction system, to build a better tool, it is imperative to consider more than one method, to understand the system as a variety of subsystems each with the learning technique suited to the specific task. In this way, AI systems in support of judicial decision-making would also be built in a hybrid way, uniting rule-based methods with empirical ones to employ the best that these techniques can offer.

This is because, despite the need for compliance with laws and the possibility of embedding binding precedents as rules in the system, a better understanding

of ambiguous or open-textured terms, the heuristics involved in the way of deciding, as well as learning through jurisprudence are very important to complement the training of the intelligent judicial decision support system.

On the other hand, it is known that some machine learning techniques are not so intelligible and interpretable as to explain the main fundamentals that would justify the draft decision offered by the system (output), however, if joined to those based on rules, such problem is mitigated, especially when the deductive logic and the explicitness they have make clear the rational path involved in the situation. Even so, given the available techniques that are intrinsically interpretable, the preferential adoption of these is recommended, but, if this is not possible, nothing prevents the use of complementary post hoc explainability tools (XAI), under the terms of the specific legislation.

As for the question of the individualization of decision support systems trained by magistrates with only their decisions, it was found to be incompatible with the current Brazilian precedents system, especially when the legislation imposes the duty to standardize jurisprudence to keep it stable, integral, and coherent. In addition, such intelligent tools are just a good device to suggest decision drafts to magistrates in accordance with the court's precedents and jurisprudence.

It is worth mentioning that democracy would not be violated, since the magistrate is not bound to decide according to the draft suggestion proposed by the intelligent decision support system, still allowing the "capillarization" of wills.

However, even in the face of an intelligent decision support system uniform by legal content, with its use, it is still possible to use as feedback the effective judicial decisions handed down by the magistrate, which are incorporated into the examples of cases contained in the system. And, in this way, the tool will, with use, be shaped with the particularities of the magistrate/user to provide more assertive drafts in the future to the point of not being possible to identify that it was proposed by a computational system.

AI's influence on the Brazilian judiciary is multifaceted, offering opportunities to enhance the legal system's efficiency, consistency, and accessibility. As the technology evolves, ongoing dialogue among legal practitioners, technologists, and policymakers will be key to navigating the ethical and practical challenges that accompany AI's integration into the judiciary.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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