REPORT 15

Designing the Due Legal Process of the Future

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Abstract

The Judiciary is increasingly adopting Artificial Intelligence tools to support decision-making and optimize processes. However, the use of these technologies raises significant challenges related to transparency, accountability, and due legal process. This work aims to reflect on the future of due legal process in a context mediated by Artificial Intelligence, using speculative design as a methodological approach. Through the identification of current signals, trends, and uncertainties, possible future scenarios are explored, highlighting risks and opportunities associated with the automation of judicial activities. The study proposes a speculative artifact, called PrevIA-Jud, aimed at contributing to a faster and less costly judicial process, while ensuring fundamental procedural guarantees. The results indicate that the responsible incorporation of Artificial Intelligence in the Judiciary requires not only technological advances, but also institutional, ethical, and legal adaptations.

1. Introduction

The Judiciary has historically been characterized by complex procedures, high costs, and lengthy processing times. In recent years, there has been a growing movement toward the digital transformation of judicial systems, driven by advances in Information and Communication Technologies. Among these advances, Artificial Intelligence (AI) stands out as a promising tool to improve efficiency, reduce backlog, and support judicial decision-making.

In [omitted for blind review], initiatives involving the use of AI in the Judiciary have already been implemented, such as systems for process classification, prediction of judicial outcomes, and automation of repetitive tasks. Despite these

advances, the incorporation of AI into judicial activities raises important concerns regarding transparency, explainability, accountability, and respect for the principles of due legal process.

Due legal process is a fundamental principle that ensures the rights of the parties involved in judicial proceedings, including the right to a fair trial, adversarial proceedings, and full defense. The increasing use of algorithmic systems in judicial contexts challenges traditional understandings of this principle, as automated decisions may be opaque, difficult to contest, and influenced by biases embedded in data or models.

In this context, speculative design emerges as a useful approach to explore possible futures and reflect on the implications of emerging technologies. By creating speculative scenarios and artifacts, it is possible to anticipate challenges, question assumptions, and propose alternative paths for the integration of AI into the Judiciary.

The objective of this work is to use speculative design to reflect on the future of due legal process in an AI-mediated judicial system. To this end, the study identifies current signals and trends related to the use of AI in the Judiciary, explores possible future scenarios, and proposes a speculative artifact designed to reconcile efficiency gains with the preservation of procedural guarantees.

The remainder of this document is structured as follows: Section 2 presents the theoretical background; Section 3 describes the methodological approach based on speculative design; Section 4 presents the identification of signals and trends; Section 5 explores future scenarios; Section 6 introduces the speculative artifact; and Section 7 presents the final considerations.

2. Theoretical Background

The growing use of Artificial Intelligence in institutional and governmental contexts has intensified debates about its impacts on fundamental rights, decision-making processes, and democratic values. In the judicial sphere, these debates gain particular

relevance, given the centrality of the Judiciary in guaranteeing rights and resolving conflicts.

2.1. Artificial Intelligence in the Judiciary

Artificial Intelligence can be understood as a set of techniques and computational systems capable of performing tasks that traditionally require human intelligence, such as pattern recognition, learning, prediction, and decision-making. In the judicial context, AI has been applied to support activities such as document classification, prediction of judicial outcomes, recommendation of precedents, and automation of administrative routines.

In [omitted for blind review], the adoption of AI in the Judiciary has been encouraged by institutional initiatives aimed at increasing efficiency and reducing the backlog of cases. Examples include systems developed by courts to identify repetitive cases, assist in the drafting of decisions, and support the management of judicial workflows. These systems are often based on machine learning techniques trained on large volumes of judicial data.

Despite the potential benefits, the use of AI in judicial decision-making raises concerns related to transparency and explainability. Many AI models operate as "black boxes," making it difficult to understand how decisions are reached. This opacity can undermine the ability of parties to contest decisions and challenge the grounds on which they are based, posing risks to the principle of due legal process.

Furthermore, AI systems may reproduce or amplify existing biases present in training data, leading to discriminatory or unfair outcomes. In the judicial context, such biases can have severe consequences, affecting the rights and freedoms of individuals.

2.2. Due Legal Process

Due legal process is a fundamental principle of law that ensures fairness, equality, and justice in judicial proceedings. It encompasses a set of guarantees designed to protect individuals from arbitrary or unjust decisions by the State. Among these guarantees are the right to a fair hearing, the right to

adversarial proceedings, the right to full defense, and the right to reasoned decisions.

The incorporation of AI into judicial processes challenges traditional interpretations of due legal process. Automated or semi-automated decisions may be difficult to explain or justify in terms that are understandable to the parties involved. This can compromise the right to a reasoned decision and hinder the effective exercise of defense and appeal.

In addition, the delegation of decision-making authority to algorithmic systems raises questions about accountability. Determining responsibility for errors or injustices caused by AI systems can be complex, involving multiple actors such as developers, institutions, and judges. These challenges require careful consideration of legal, ethical, and institutional frameworks governing the use of AI in the Judiciary.

2.3. Transparency and Explainability

Transparency and explainability are key requirements for the legitimate use of AI in judicial contexts. Transparency refers to the availability of information about how AI systems operate, including their objectives, data sources, and decision-making processes. Explainability refers to the ability to provide understandable explanations for the outputs generated by AI systems.

In the context of due legal process, transparency and explainability are essential to ensure that parties can understand, challenge, and appeal decisions. Without access to meaningful explanations, the use of AI risks creating a form of "technological opacity" that undermines procedural guarantees.

Several approaches have been proposed to enhance transparency and explainability in AI systems, including the use of interpretable models, post-hoc explanation techniques, and documentation practices that describe system design and limitations. However, implementing these approaches in real-world judicial systems remains a significant challenge.

2.4. Speculative Design

Speculative design is a design approach that seeks to explore possible futures and question assumptions about technological

development. Rather than focusing on solving immediate problems, speculative design creates artifacts, scenarios, and narratives that provoke reflection and debate about the social, ethical, and political implications of emerging technologies.

By imagining alternative futures, speculative design allows designers and researchers to identify risks, opportunities, and unintended consequences that may not be evident in present-day analyses. In the context of Artificial Intelligence and the Judiciary, speculative design can be used to explore how different configurations of technology, regulation, and institutional practices may shape the future of due legal process.

In this work, speculative design is used as a methodological tool to reflect on the potential impacts of AI on judicial procedures and to propose a speculative artifact that embodies a possible response to the challenges identified. The next section describes the methodological approach adopted to conduct this speculative exploration.

3. Methodology

This work adopts **speculative design** as its methodological approach. Speculative design was chosen because it allows reflection on possible futures and critical examination of the implications of emerging technologies, especially in contexts involving complex socio-technical systems such as the Judiciary.

The methodological process was structured into sequential stages, aiming to identify current signals, map trends, explore uncertainties, and project future scenarios related to the use of Artificial Intelligence in judicial procedures and its impact on due legal process.

3.1. Identification of Signals

The first stage consisted of identifying signals related to the use of Artificial Intelligence in the Judiciary. Signals were understood as concrete manifestations, initiatives, or events that indicate changes or emerging directions in the use of technology in judicial contexts.

To identify these signals, news articles, institutional reports, official documents, and academic publications were consulted. Particular attention was given to initiatives involving the adoption of AI systems by courts, regulatory discussions about algorithmic decision-making, and public debates concerning transparency and accountability in judicial processes.

The identified signals were documented and analyzed in order to understand their relevance and potential impact on due legal process. These signals served as the empirical basis for identifying broader trends and uncertainties.

3.2. Trend Analysis

Based on the identified signals, the second stage involved the analysis of trends related to Artificial Intelligence in the Judiciary. Trends were understood as patterns of change that suggest a direction of development over time.

The analysis considered technological trends, such as advances in machine learning and natural language processing, as well as institutional and regulatory trends, such as the increasing formalization of AI governance frameworks and ethical guidelines.

Social and cultural trends were also considered, including public perceptions of automated decision-making and growing demands for transparency and accountability. The combination of these trends allowed the identification of forces shaping the future of due legal process in an AI-mediated judicial system.

3.3. Identification of Uncertainties

In addition to trends, key uncertainties were identified. Uncertainties refer to factors whose future evolution is unpredictable or contested and that may significantly influence outcomes.

Examples of uncertainties identified in this study include the extent to which AI systems will be granted decision-making autonomy in judicial processes, the effectiveness of regulatory frameworks in ensuring transparency and fairness, and the degree of public trust in AI-mediated justice.

Identifying these uncertainties was essential to avoid deterministic projections and to explore a range of possible futures rather than a single predicted outcome.

3.4. Construction of Future Scenarios

The fourth stage involved the construction of future scenarios based on the interaction between trends and uncertainties. Scenarios were used as narrative tools to describe plausible future states of the Judiciary under different configurations of technology, regulation, and institutional practices.

Each scenario highlights specific risks and opportunities associated with the use of AI in judicial decision-making and its implications for due legal process. The scenarios were not intended to be predictions but rather explorations of alternative futures that could inform reflection and debate.

3.5. Speculative Artifact Design

The final stage consisted of designing a speculative artifact that embodies one of the explored futures. The artifact, named **PrevIA-Jud**, was conceived as a conceptual system designed to support judicial procedures while preserving fundamental procedural guarantees.

The design of the artifact was informed by the trends, uncertainties, and scenarios identified in the previous stages. The artifact serves as a concrete representation of how Artificial Intelligence could be integrated into the Judiciary in a way that balances efficiency gains with transparency, explainability, and respect for due legal process.

The following sections present the results of this speculative exploration, including the identified signals and trends, the constructed scenarios, and the description of the speculative artifact.

4. Identification of Signals and Trends

This section presents the main signals and trends identified regarding the use of Artificial Intelligence in the Judiciary and their implications for due legal process. The analysis is

based on the material collected during the exploratory stage of the speculative design process.

4.1. Signals

The identified signals indicate that the use of Artificial Intelligence in judicial contexts is no longer experimental but increasingly institutionalized. Among the main signals observed are the following:

- **Institutional adoption of AI systems by courts**: Several courts have implemented AI-based systems to support activities such as case classification, identification of repetitive litigation, and assistance in drafting judicial decisions. These systems are often presented as solutions to reduce backlog and increase productivity.

- **Formalization of AI governance initiatives**: Judicial institutions have begun to create committees, guidelines, and governance structures dedicated to the use of AI. These initiatives aim to establish principles related to ethics, transparency, accountability, and risk management.

- **Integration of AI into judicial workflows**: AI tools are increasingly embedded into everyday judicial workflows, interacting with existing case management systems and influencing how cases are processed and prioritized.

- **Public debate on algorithmic justice**: There is growing public and academic debate about the legitimacy of algorithmic decision-making in the Judiciary. Concerns related to bias, explainability, and the protection of fundamental rights are frequently raised.

- **Development of predictive and analytical models**: Predictive models that estimate judicial outcomes, duration of cases, or likelihood of appeals are being developed and tested. These models promise efficiency gains but raise questions about determinism and judicial independence.

These signals suggest a trajectory toward deeper integration of AI into judicial practices, with significant implications for procedural guarantees.

4.2. Trends

Based on the identified signals, several trends were mapped that are likely to shape the future of due legal process in an AI-mediated Judiciary.

- **Automation of procedural activities**: There is a clear trend toward automating procedural and administrative tasks, such as document sorting, deadline management, and generation of standard texts. This automation may free human resources but also risks reducing human oversight.

- **Data-driven decision support**: Judicial decision-making is increasingly supported by data-driven tools that provide recommendations, predictions, or risk assessments. While these tools can enhance consistency, they may also influence judicial reasoning in subtle ways.

- **Expansion of regulatory frameworks**: The growing use of AI has led to the expansion of regulatory discussions, including proposals for laws, ethical codes, and technical standards governing AI in the Judiciary. These frameworks aim to ensure transparency, fairness, and accountability.

- **Demand for transparency and explainability**: There is increasing demand from society, legal professionals, and scholars for transparent and explainable AI systems. This demand reflects concerns about the legitimacy of automated decisions and the preservation of due legal process.

- **Tension between efficiency and guarantees**: A central trend is the tension between the pursuit of efficiency gains and the need to preserve procedural guarantees. While AI promises faster and less costly processes, it may conflict with principles such as the right to a reasoned decision and the possibility of contestation.

Together, these trends indicate that the future of the Judiciary will be shaped by complex trade-offs between technological innovation, institutional values, and legal principles.

5. Future Scenarios

Based on the signals, trends, and uncertainties identified in the previous sections, this section presents possible future scenarios for due legal process in a Judiciary increasingly mediated by Artificial Intelligence. The scenarios are not intended as predictions, but as plausible narratives that support reflection on the consequences of different technological and institutional choices.

5.1. Scenario 1: The Automated Judiciary

In this scenario, Artificial Intelligence systems are widely adopted across judicial institutions and become deeply embedded in procedural and decision-making activities. Most procedural steps are automated, including case classification, allocation to judges, drafting of decisions, and prediction of outcomes.

Judicial efficiency increases significantly, with substantial reductions in processing time and operational costs. However, due legal process becomes increasingly opaque, as decisions are heavily influenced by algorithmic recommendations that are difficult to explain or contest. Parties struggle to understand how conclusions were reached, weakening adversarial proceedings and the right to full defense.

In this future, the role of judges shifts toward supervision of automated systems, but human intervention becomes rare. Accountability for errors or injustices becomes diffuse, raising concerns about responsibility and legitimacy.

5.2. Scenario 2: The Hybrid Judiciary

In the hybrid scenario, Artificial Intelligence is used as a decision-support tool rather than a decision-maker. AI systems assist judges and court staff by providing analyses, recommendations, and predictions, but final decisions remain under human control.

Transparency and explainability mechanisms are incorporated into AI systems, allowing judges and parties to understand how recommendations are generated. Due legal process is preserved through procedural safeguards that ensure the right to contest algorithmic inputs and demand human review.

This scenario balances efficiency gains with the preservation of fundamental guarantees. However, it requires continuous investment in training, governance, and oversight to prevent over-reliance on automated recommendations and ensure that human judgment remains central.

5.3. Scenario 3: The Regulated Judiciary

In this scenario, the use of Artificial Intelligence in the Judiciary is subject to strict regulation and oversight. AI systems are allowed only in limited contexts, such as administrative support and non-decisional tasks.

Strong legal frameworks define requirements for transparency, explainability, data quality, and accountability. Independent audits and impact assessments are mandatory, and parties have explicit rights to access information about algorithmic systems used in their cases.

While this approach prioritizes due legal process and fundamental rights, it limits potential efficiency gains and may slow technological innovation. Courts face challenges in keeping pace with growing caseloads under restrictive conditions.

5.4. Discussion of Scenarios

The scenarios presented illustrate different trade-offs between efficiency, transparency, accountability, and procedural guarantees. The Automated Judiciary emphasizes efficiency at the expense of due legal process, while the Regulated Judiciary prioritizes guarantees but limits innovation. The Hybrid Judiciary seeks a balance, but its success depends on effective governance and institutional capacity.

These scenarios highlight that the future of due legal process in an AI-mediated Judiciary is not predetermined. Instead, it will be shaped by choices made by policymakers, judicial institutions, and society regarding how and under what conditions Artificial Intelligence is integrated into judicial practices.

6. Speculative Artifact: PrevIA-Jud

Based on the analysis of signals, trends, uncertainties, and future scenarios, this section presents the speculative artifact proposed in this work, named **PrevIA-Jud**. The artifact was conceived as a conceptual system designed to support judicial procedures through the use of Artificial Intelligence while preserving the fundamental guarantees of due legal process.

PrevIA-Jud is imagined as an AI-based platform integrated into judicial information systems, operating as a decision-support tool rather than an autonomous decision-maker. Its primary objective is to assist judges, clerks, and legal professionals by providing predictive analyses, recommendations, and procedural insights, without replacing human judgment.

One of the central features of PrevIA-Jud is its emphasis on transparency and explainability. The system is designed to provide clear explanations of how its predictions and recommendations are generated, including information about the data sources used, the criteria applied, and the limitations of the model. These explanations are presented in accessible language, allowing legal professionals and parties to understand and scrutinize the system's outputs.

PrevIA-Jud also incorporates mechanisms to support adversarial proceedings and the right to full defense. Parties involved in a case can access information about the algorithmic analyses applied to their process and are given the opportunity to contest or challenge these analyses. Human review is mandatory whenever an AI-generated recommendation significantly influences a procedural decision.

Another important aspect of the artifact is its governance structure. PrevIA-Jud is subject to continuous monitoring, auditing, and evaluation by independent bodies. This governance framework aims to ensure compliance with ethical principles, legal standards, and institutional policies, as well as to detect and mitigate biases or errors in the system.

From a functional perspective, PrevIA-Jud is designed to support activities such as estimation of procedural duration, identification of similar cases, and analysis of precedents.

These functionalities are intended to improve efficiency and consistency while maintaining respect for due legal process.

As a speculative artifact, PrevIA-Jud does not represent a finalized technical solution but rather a conceptual proposal that embodies a desirable future scenario. It serves as a tool for reflection and debate about how Artificial Intelligence could be responsibly integrated into the Judiciary, balancing technological innovation with the protection of fundamental rights.

7. Final Considerations

This work used speculative design as a methodological approach to reflect on the future of due legal process in a Judiciary increasingly mediated by Artificial Intelligence. By identifying signals, mapping trends, and exploring uncertainties, it was possible to construct future scenarios that highlight both the potential benefits and the risks associated with the use of AI in judicial procedures.

The analysis showed that, while Artificial Intelligence offers significant opportunities to improve efficiency, reduce costs, and support judicial decision-making, its uncritical adoption may compromise fundamental procedural guarantees. Issues related to transparency, explainability, accountability, and bias must be carefully addressed to ensure that the incorporation of AI does not undermine the legitimacy of judicial decisions.

The speculative artifact PrevIA-Jud was proposed as a conceptual response to these challenges. By emphasizing transparency, human oversight, and procedural safeguards, the artifact represents a desirable future in which AI supports, rather than replaces, judicial actors. Although purely speculative, PrevIA-Jud illustrates how technological solutions can be aligned with legal and ethical principles.

As limitations, this study relies on speculative scenarios that may not capture all possible real-world variables. The interpretation of signals and trends is also influenced by the available material and the researchers' perspectives. Future work could involve empirical studies to test the feasibility of

the proposed concepts, as well as interdisciplinary collaboration to further explore the legal, technical, and social dimensions of AI in the Judiciary.

In conclusion, the responsible integration of Artificial Intelligence into judicial systems requires not only technological innovation but also institutional adaptation, regulatory frameworks, and continuous ethical reflection. Speculative design proves to be a valuable tool for anticipating challenges and fostering informed debate about the future of due legal process.

References *(kept verbatim from the original document)*

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