

Beyond the Courts: Artificial Intelligence as a Catalyst for Change in Justice Administration

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Abstracts

In the context of technological advances, the concept of digital justice is emerging, an extra-judicial sphere that uses technologies such as artificial intelligence to address controversial situations through physical assistants or even robots, if the litigant so wishes. Thus, while AI is effective in resolving simple disputes without human intervention, even UNESCO warns against its exclusivity in more complicated cases. From this perspective, through a qualitative approach and literature review, this research focused on examining the benefits and limitations of AI in the administration of justice. The review of the academic literature reveals that this technology facilitates the functions performed by judges and lawyers in controversial situations. The studies, however, point to the importance of using human intelligence in law making and more general judicial processes. In conclusion, AI improves the efficiency of the administration of justice; however, its place in judicial operations and process should only be complementary to the use of human intervention. This action maintains fairness and considers the ethical point at stake, reaffirms the existence of some irreplaceable human capabilities in the judicial process.

Keywords: Lawyers, administration of justice, ethics, artificial intelligence.

Introduction

In the changing legal environment, Artificial Intelligence has become an essential factor in the organization and work of the judicial system. Since its adoption, according to Terzidou (2022), it has brought significant benefits that go beyond the simple automatism of archetypal cases and have spread throughout the judicial system in general, as well as enabling not only the handling of cases, but also perfecting the adjudication, and thus setting standards in terms of the development of law.

In this context, the need to understand the role of lawyers and judges in the technological contemporary emerges. The integration of tools based on artificial intelligence redefines the nature of their work, requiring adaptive skills and a deep understanding of the capabilities and limitations of technology. According to Suárez and De León (2019), legal professionals are compelled to assume a role more oriented towards the strategic management of AI-generated information, recognizing its capacity to optimize legal processes and enhance legal analysis.

Despite technological advances, debate persists about the irreplaceable role of human nature in procedural decision-making and the application of justice. Muñoz (2020) argues that ethical and moral sensitivity, inherent to the human condition, plays an irreplaceable role in interpreting nuances and contexts that escape the algorithmic logic of artificial intelligence. This perspective raises crucial questions about the need to safeguard the human dimension in an increasingly technological environment.

Given these conditions, the study sought to analyze the existing academic literature in order to articulate guidelines for achieving a harmonious balance between the use of technology, in particular artificial intelligence, and the irreplaceable role of the human being in legal decision-making. Through this analysis, the aim is to contribute to an informed debate that fosters the beneficial coexistence of technological innovation and human wisdom in the judicial sphere.

Literature review

The study addresses the growing interest in the integration of AI in the administration of criminal justice. Various theoretical perspectives and empirical findings are explored to understand the evolution and current scope of this technology in the legal field. This literature review seeks to identify advantages, challenges and ethical considerations associated with its use in criminal justice, with the aim of pointing out trends, areas of controversy and possible future research directions.

Artificial Intelligence and the Administration of Justice

Artificial intelligence (AI) has generated a growing interest in the administration of criminal justice. Ligeti (2019) defines it as the ability of machines to perform tasks that previously required human intelligence. In this context, AI is used to analyze data, identify patterns and make automated or computer-assisted decisions. Binns et al. (2018) describe AI as a multidisciplinary field with various techniques, such as machine learning and natural language processing, that have potential applications in the legal field. AI has been shown to be useful in areas such as crime pattern detection, recidivism risk assessment and legal document analysis.

The application of AI in criminal justice dates back to the 1970s, when expert systems were developed to assist lawyers and judges in legal research and decision-making (Gutiérrez and Flórez, 2020). These systems used rules coded by human experts to solve specific problems in the legal field.

With technological advancement, AI began to play a greater role in the administration of criminal justice. In the 1990s, the first crime prediction systems emerged, based on statistical models to identify areas with a higher probability of criminal activity (Flórez, 2020). Although controversial, these systems laid the foundations for the application of AI techniques in crime prevention and justice system management.

Artificial intelligence (AI) has had a significant impact on the administration of criminal justice by improving the efficiency of the judicial system, increasing the accuracy of criminal risk assessment and optimizing investigative processes (Fishel et al., 2018). In particular, it is used

to detect and study criminal patterns, as noted by Nowotko (2021), who highlights how AI algorithms analyze large volumes of data to identify trends and patterns that aid in crime prevention and efficient resource allocation. For example, crime prediction systems, as described by Freeman (2016), use statistical models and machine learning algorithms to predict the likelihood of crime in specific areas, enabling proactive preventative measures.

In addition, AI is used to improve efficiency in criminal case management. AI-based case management systems automate administrative tasks, such as scheduling hearings and document management, freeing up time for more strategic activities (Becker et al., 2022). Similarly, in the review of evidence and proof, pattern recognition algorithms, as mentioned by Rubim and Fortes (2021), identify and analyze relevant data to help build stronger cases.

Artificial intelligence is central to the management of the criminal justice system, especially in the assessment of criminal risk through machine learning algorithms (Završnik, 2020). While these systems can assist judges, they raise ethical concerns about fairness and transparency (Ugwudike, 2020). AI ranges from crime prevention to legal decision-making, but its implementation must be careful and ethical to ensure a fair judicial system.

Materials and Methods

This research is guided by a qualitative approach to analyze the integration of artificial intelligence within the legal landscape, with a specific emphasis on its application in criminal justice. Dahlberg and Dahlberg (2019) highlight the holistic nature of the qualitative approach in comparison to the theoretical frameworks on which it is based. According to Flick (2012), qualitative research involves the analysis of discourses, opinions and arguments to understand social phenomena holistically, allowing for a detailed understanding of the object of study.

In delimiting the scope of the study, we adopted a descriptive methodology, as advocated by Guevara et al. (2020). This approach allows for a detailed exploration of the key aspects of the topic under examination, facilitating an exposure to its characteristics and patterns within the context of the research.

In terms of research design, we opted for a documentary review method, drawing on contemporary research traditions, in particular studies concerning the use of artificial intelligence in criminal law, as highlighted by Barraza (2018). A defining characteristic of documentary research is its reliance on secondary data as a primary source of information. This methodological choice guides the research process by establishing links between existing information and the focal point of the study.

Research Techniques and Instruments

- We selected academic publications that had undergone a peer review process and were published in reputable journals.

With regard to the exclusion of bibliographic sources, the following criteria were assumed:

- Eliminate documentary sources that do not relate to the essential aspects of the study.
- Reject articles that, although they refer to artificial intelligence (AI) and its application in criminal justice, do not address the challenges faced by judges and lawyers when using this technology in legal decision-making.
- Do not consider bibliographic material that does not meet scientific standards in the conclusions.

The body of bibliographical material associated with the study was organized into a documentary corpus comprising approximately 95 research studies relevant to the topic under consideration.

Second Phase – Analysis

During this stage of the research, we sought to analyze the documents collected. The main objective was to determine both the benefits and contributions that Artificial Intelligence offers in the management of criminal justice. In addition, the challenges and ethical considerations that emerge when employing this technology in the legal field were explored. Perspectives were reviewed and recommendations relevant to the appropriate use of AI in jurisprudence are offered.

Third Phase – Discussion

The last phase of the study is oriented towards reflecting on the needs that jurists face when using AI in the administration of justice.

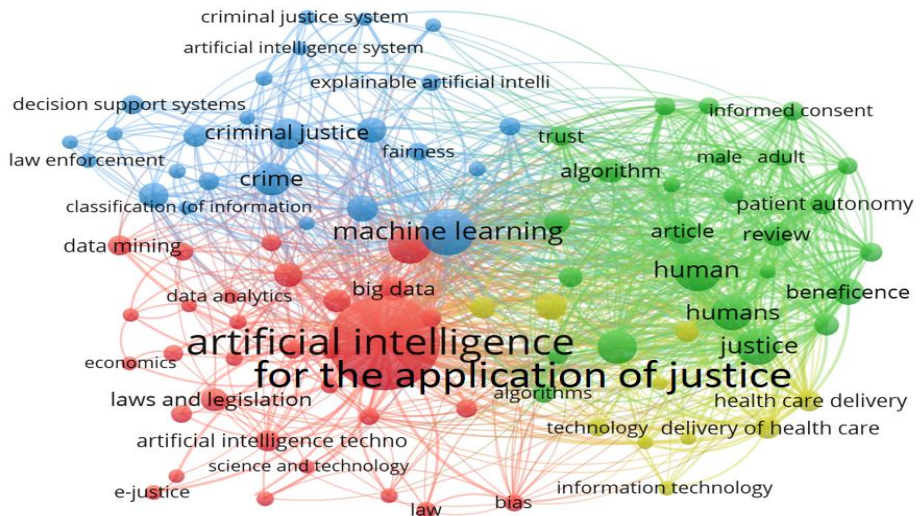
Results

The results of the study are oriented towards the fulfilment of the proposed objectives and the development of the stages in which the research is framed.

- Results First Phase - Document Retrieval

This stage of the study focuses on the search for academic documents inherent to the use of AI by jurists in the administration of criminal justice. In particular, the bibliographic sources consulted belong to the SCOPUS repository. Around 95 bibliographic sources were consulted, and a bibliometric network was created (see figure 2) that integrated different key aspects surrounding the object of study.

Figure 2. Bibliometric Network Artificial Intelligence in criminal justice enforcement



Note: The figure shows in detail key aspects of the use of AI in the administration of criminal justice. Source: Vosviewer.

The results of the bibliographic search allow us to identify relevant topics that contribute to the analysis of the object of study, including the benefits and advantages that AI offers jurists in criminal decision-making, the ethical challenges they must face and some recommendations for the reasonable use of this technology.

- Second phase results – Analysis

Artificial intelligence (AI) in the administration of criminal justice has sparked an in-depth debate in the academic literature, which has been divided into three lines of research: advantages, challenges and recommendations. In terms of advantages, it highlights increased efficiency, improved accuracy of judicial decisions and facilitated access to justice for marginalized communities. However, ethical challenges such as algorithmic biases and data protection are also addressed, highlighting the importance of transparency and accountability in automated decision-making. Finally, it offers recommendations for an ethical and balanced implementation of AI in the judicial system, emphasizing the need to preserve fundamental ethical and legal principles.

In the following paragraphs, each of these lines of research will be explored in more detail, analyzing the emerging findings in the academic literature.

- Advantages and benefits of AI in the administration of criminal justice

In the first line of research on the implementation of artificial intelligence (AI) in the administration of criminal justice, the advantages and benefits of this technology have been highlighted. Authors such as (Bagherian et al., 2021; Zerilli et al., 2022; Holm and Lorenz, 2022)

have shown that advances in AI, such as natural language processing and machine learning, make it possible to analyze large amounts of information quickly and accurately. These tools can identify patterns and relationships in legal data, streamlining document review and the search for information relevant to court cases. In addition, the implementation of AI systems in docket management has improved the organization and tracking of cases, reducing waiting times and optimizing the resources available in the courts.

Research by Faggella (2020) and Van (2019) highlights that artificial intelligence provides predictive analytics based on historical data, which helps judges assess risks and make informed decisions in injunctive relief and sentencing. In addition, it identifies relevant legal precedents and predicts judicial outcomes to increase consistency and objectivity. On the other hand, research such as Covelo de Abreu (2019), Silveira et al. (2020) and Završnik (2020) shows that AI can mitigate biases by analyzing historical data and judicial patterns, providing objective recommendations for more impartial decisions. However, AI implementation raises ethical and legal challenges about transparency and accountability in decision making.

Studies by Liu et al. (2019), Forrest (2021) and Rudschies and Schneider (2024) highlight that artificial intelligence overcomes barriers to access to justice by providing automated online legal advice, streamlining legal processes and reducing costs and waiting times. However, it is crucial to ensure the accessibility of these tools for all citizens. In the first line of research, consensus is found among scholars on the significant contribution of AI in the administration of criminal justice by improving the quality and fairness of judicial decisions. Although AI offers solutions, it raises ethical and practical questions about its responsible implementation, requiring a continuous dialogue between researchers, legal professionals and legislators to establish ethical and equitable regulatory frameworks.

- Challenges and ethical considerations of AI in the administration of criminal justice

Analysis of the academic literature reveals challenges and ethical considerations in the implementation of artificial intelligence (AI) in the administration of criminal justice. Of particular note are algorithmic biases, highlighted by Larsson and Heintz (2020), Baclic et al. (2020), and Roberts et al. (2021), which can amplify biases in training data and lead to unfair or discriminatory judicial decisions. To mitigate these risks, the implementation of continuous auditing and monitoring processes, as proposed by D'Acquisto (2018), Yeung (2019) and Barona Vilar (2019), is suggested, along with a transparent approach to algorithm design and development to facilitate oversight by legal professionals and the public.

Another crucial aspect to consider is data protection and the privacy of the parties involved in legal proceedings. The massive collection of personal data in the context of artificial intelligence poses considerable ethical and legal challenges in terms of privacy and information security. As noted by (Cabrera, 2018; Larsson, 2019), the misuse or unauthorized disclosure of sensitive data can lead to serious consequences for individuals and undermine trust in the judicial system.

According to Barbaro (2018) and Hacker (2018), to address the challenges in the application of artificial intelligence in the administration of criminal justice, it is crucial to implement robust data protection policies and practices in line with regulations such as the European Union's General Data Protection Regulation (GDPR). In addition, the need to use anonymization and

encryption techniques to safeguard the privacy of parties involved in court cases is emphasized. Transparency in data management and use is also highlighted as a key element to promote public confidence in the application of AI in this area.

The discussion on the implementation of AI in the administration of criminal justice has raised concerns about its impact on the fairness of the judicial system. Despite the recognition of AI's potential to improve the efficiency and accuracy of judicial decisions, there are also warnings about the risk of aggravating disparities in access to justice. According to Calderón et al. (2021), marginalized communities could face additional barriers to taking advantage of AI technology, thus widening the equity gap in the judicial system.

To address the complexity in implementing AI in criminal justice management, Davis (2018) highlights the importance of taking a proactive and equitable approach. This involves ensuring that AI algorithms are sensitive to cultural and socioeconomic differences, and implementing specific measures to ensure equitable access to technology and information. In addition, it highlights the need to conduct periodic assessments of the impact of AI on the fairness of the judicial system and implement corrective measures as necessary.

According to Etzioni (2016), implementing AI in criminal justice in an ethical and responsible manner requires a clear regulatory framework and adequate oversight. Lack of regulations can lead to unfair practices. It is essential to establish defined ethical and legal standards, as well as effective oversight mechanisms. This involves collaboration among different stakeholders to develop sound policies that address ethical and legal challenges. Thus, while AI offers opportunities to improve criminal justice, it also poses significant challenges that require a proactive and systematic approach to ensure its proper implementation.

- Perspectives and recommendations

In the field of artificial intelligence and its impact on the administration of justice, the importance of considering future perspectives and recommendations is highlighted. Authors such as Castañeira (2020) and Ortega (2021) highlight the potential of AI to improve judicial efficiency and facilitate access to justice. However, Ashley (2017) emphasizes the need to establish clear and transparent regulations to address ethical and legal issues, as well as to prevent possible algorithmic bias and discrimination.

In terms of recommendations for legislators, judges and legal practitioners, the academic literature offers a number of key orientations. Carneiro et al., (2014) suggest that legislators should update existing laws to address the challenges and opportunities posed by AI, ensuring fairness in access to justice and the protection of individual rights. On the other hand, Grabmair et al., (2015) emphasize the importance of judges being aware of the limitations and possible biases of AI systems, using this technology as a complementary tool in judicial decision making. In addition, Kim et al., (2018) highlight the need for legal professionals to familiarize themselves with the operation and legal implications of AI, incorporating ethical principles into their professional practice and advocating for the protection of their clients' rights.

Finally, it is essential to reflect on the balance between AI-driven innovation and the protection of fundamental rights. Xu (2019) posits that while AI has the potential to improve efficiency and

fairness in the judicial system, it also raises ethical and legal challenges that should be approached with caution. A balance needs to be struck between technological innovation and the protection of human rights, ensuring that AI is used responsibly and ethically in the administration of justice.

- Results Third Phase – Discussion

From the review of specialized literature, it has been found that artificial intelligence represents a significant change in the administration of criminal justice. Its advantages and benefits are undeniable, as it facilitates the automation of repetitive tasks, streamlines judicial processes and contributes to more objective and data-driven decision-making (Lettieri et al., 2019). However, this same technology raises challenges and ethical considerations that cannot be overlooked. Studies have pointed out that the implementation of AI in criminal justice administration may generate algorithmic biases, unfair discrimination, and lack of transparency in decisional processes (Rzecki et al., 2017). In addition, there is concern that over-reliance on AI systems may undermine human autonomy and accountability, thus undermining trust in the judicial system (Shneiderman, 2020).

Given these challenges, it is essential to consider future perspectives and recommendations that seek to balance the role of AI with human intervention in the administration of criminal justice (Velasco, 2022). Although this technology improves efficiency in the judicial system, it is essential to recognize that human participation is irreplaceable, especially when it comes to processes that affect the life and liberty of individuals (Asís Roig, 2018). In this sense, it becomes necessary to establish an appropriate balance between technology and human intervention. Legislation and judicial decision-making must be guided by ethical principles and human values, ensuring that the fundamental rights of individuals are protected and respected at all times (Zarsky, 2016).

Therefore, it is pertinent that AI systems in the administration of criminal justice be designed in a transparent and ethical manner, with adequate accountability mechanisms and human oversight (Shageeva, 2018). In addition, it is necessary to invest in training and skills development for legal professionals so that they can understand and effectively use AI in their daily work (Vallespín, 2023). Ultimately, while AI offers significant benefits in the administration of criminal justice, its implementation must be carefully managed to ensure fairness, transparency and respect for human rights. It is through the combination of artificial intelligence and human intervention that a fair and efficient judicial system can be ensured for the benefit of society as a whole.

Conclusions

The emerging conclusions of this study lead to reflect on the role of artificial intelligence in the administration of criminal justice and the possible implications that this technology could have in the future, considering the importance of treating human beings according to their nature. First, it has become evident that AI presents both significant advantages and challenges in the field of criminal justice. On the one hand, the implementation of AI systems can improve efficiency in case management, streamline judicial processes, and contribute to more objective and data-driven decision making. However, it is necessary to recognize that AI is not free from

algorithmic biases, which can lead to unfair discrimination and lack of transparency in decision-making processes. In this regard, it is critical to proactively address the ethical and legal challenges associated with AI in the administration of criminal justice. It is necessary to establish oversight and accountability mechanisms that ensure fairness and impartiality in the judicial system, as well as to promote greater transparency in the development and use of AI algorithms. In addition, it is paramount to recognize the irreplaceable role of human intervention in the judicial process. While AI can be a valuable tool for improving efficiency and accuracy in decision making, it should never replace human judgment and understanding of the individual contexts and specific circumstances of each case. In terms of future prospects, it is critical to continue to research and develop AI technologies that are ethical, transparent and accountable. This includes close collaboration between AI experts, legal practitioners, academics and society at large to ensure that the implementation of AI in the administration of criminal justice is conducted in a fair and equitable manner. In conclusion, AI has the potential to positively transform the administration of criminal justice, but its use must be carefully managed to avoid unintended consequences and ensure that the fundamental rights of individuals are protected and respected at all times. It is through a balanced combination of artificial intelligence and human judgment that a fairer, more transparent and effective judicial system could be built for all.

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