

Artificial Intelligence and the Radical Overhaul of Penal Codes: Challenges for Modern Criminal Justice

Zhu Haijing¹, Fang Rui²

¹School of Cultural and Law,
Guizhou Qiannan Economic College Guizhou Province, China.

²Department of Foreign Languages,
Southwest Jiaotong University Hope College Sichuan province, China.

Article Info	ABSTRACT
Article History: Received Apr 09, 2026 Revised May 07, 2026 Accepted Jun 09, 2026 Keywords: Artificial Intelligence (AI), Machine Learning (ML), Penal Codes, Criminal Justice, Judicial Systems	It makes sense that the application of machine learning (ML) and artificial intelligence (AI) in criminal justice has generated controversy. Many questions have been highlighted by the recent use of these technologies as risk-needs evaluation instruments and their possible future use as AI judges. Some are concerned that these algorithmic tools reinforce pre-existing prejudices, while others are concerned that they present significant issues with Due Process or Equal Protection. Others raise a more esoteric worry, arguing that ML techniques are fundamentally incapable of moral judgment, which they believe is essential for judicial decision-making, particularly in criminal cases. As a result, they worry that these instruments are particularly unsuitable to completely replace judges and provide insufficient methods of determining the destiny of criminal offenders. This comment aims to refute this criticism. In light of AI-driven crimes and digitally mediated offenses, this article explores the necessity of a drastic revision of criminal laws. The inadequacy of traditional criminal law concepts for use against modern crimes, including those enabled by deep fake technology, algorithmic discrimination, automated cyber-attack, financial crime based on artificial intelligence (AI) technology, and the improper use of generative AI technology, is explored. The Study highlights the current increase in innovation in the delivery of legal services through the use of AI applications, which can provide greater efficiency and ability to predict future events, along with the ethical concerns associated with such innovations: including concerns about bias, transparency, and the extent to which humans can be relied upon to provide oversight over such systems. The purpose of this Study was to identify three important categories of AI-based innovations to justice. These are: (1) Predictive justice, i.e., the use of AI tools for analysing jurisprudential data to assist legal professionals in making decisions; (2) Human machine collaboration, i.e., using AI to assist legal professionals in managing cases and conducting legal research; (3) The use of robots to assist with providing automated justice in the form of automated legal judgments.
Corresponding Author: Zhu Haijing, School of Cultural and Law, Guizhou Qiannan Economic College Guizhou Province, China.	

1. INTRODUCTION

Considering the introduction of advanced technologies such as big data analytical techniques, ML and those incorporated with artificial intelligence are changing both how we assess crime risk and the way we carry out our justice systems from a technological standpoint authors disagree on whether these technologies represent a ‘cure-all’ solution for criminal justice systems but both sides of the debate agree these new advanced technologies have significant implications for criminal justice Systems [1]. Automation using AI systems also forces us to slow down and reflect on foundational questions about our Criminal Justice System [2]: What does an explanation of the grounds for a judgement mean? When is the process of making a judicial decision transparent? To whom are (semi-) automated decisions accountable and how does responsibility for a (semi-) automated decision get distributed among all actors involved when AI is being used to facilitate a final decision? What constitutes a fair trial? and Do AI systems in any way impact the due process of law rights of an accused person at any point in a criminal trial?

The sophistication of the current AI systems that are used to make decisions in the criminal justice system can create a “black box” effect [3], where the process of how a decision was reached is hidden from human scrutiny due to the complexity of the technology involved. In many cases of applied machine learning, new ways exist to use unsupervised learning or “active learning” with little or no input from human beings during the algorithm’s training process to make decisions. For example, with active approaches to using machine learning for natural language processing, the algorithm uses an extensive data set of unlabelled data sets to iteratively select some of those unlabelled data points for a human annotator to assign an appropriate label. The term “active” comes from the fact that the algorithm determines which examples will be labelled by the human based on its current estimate. The major premise of active machine learning is to reduce or eliminate human involvement in the process. Furthermore, ANNs learn how to perform tasks by looking at examples and typically do not have any specific programming instructions regarding how to perform that task. Therefore, artificial neural networks have many applications in various fields, including computer vision, natural language processing, geoscience (for creating models of the ocean), and cybersecurity (for distinguishing between valid and illegitimate activity). They are able to derive insights about how cats look in images or how pedestrians behave in traffic by themselves, without requiring an annotated dataset of examples that represent cats or pedestrians. In addition, even the researchers who create machine learning algorithms do not know what goes into making a machine-learned decision because the operations of the algorithm are not transparent.

Regardless of whether or not lack of transparency in these types of machine learning systems is a problem in other areas of applied machine learning, as the examples below illustrate [4], AI systems must provide transparency when used in criminal justice contexts. The ability for a defendant to understand the reasoning and logic behind the decision made by an AI-based system is a matter of high—and perhaps even civilizational—importance, and there is no acceptable legal basis under which AI-based decision-making can be justified as legitimate if the underlying decision-making process is opaque and incomprehensible. The opaque nature of AI-based decision-making systems may result in an infringement of civil liberties when they are implemented to assist law enforcement agencies with respect to assessing and evaluating evidence provided to them in a criminal case.

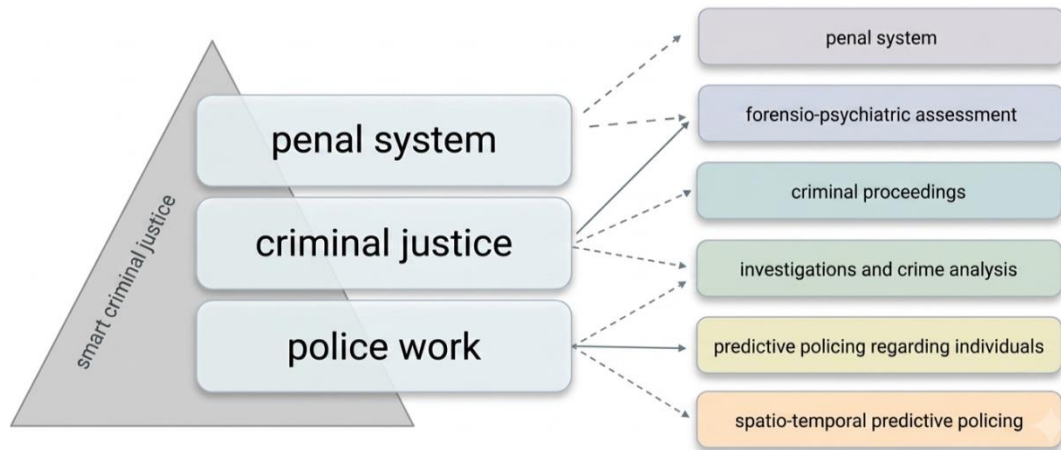


Figure 1. Proposed Architecture of the Intelligent Criminal Justice System

This study allowed us to draw general conclusions about technology and criminal justice as shown in Figure 1, indicating a broader trend towards increasing use of algorithm-based solutions in this field, as well as other technological advancements [5]. Additionally, the data reveal that the need for an increased reliance on algorithms generally arises from significant criminal incidents and media pressure, resulting in the shifting of criminal justice from being primarily repressive towards having a more preventative approach. This research also highlighted the psychological factors involved with algorithms; while those who obtain algorithm-based solutions are generally positive towards these tools, those who decide not to obtain such tools tend to be more sceptical.

In order to facilitate a greater understanding of the subject at hand, an appropriate theoretical framework will be developed [6]. This will summarize the existing literature and outline the key theories that define the field of AI and justice, establishing a solid framework for future research in these two fields.

2. LITERATURE REVIEW

Technological advancement and the development of AI are highlighting how humans will not be able to sustain the current assumption of their superiority over machines because of 'autonomous' machines. It is becoming easier to see how these artificial things will affect human existence in many ways [7]. This situation creates a need for us to explore and assess the interpenetration of human subject/object relations to build a criminal law that will be in line with these technological advancements. While the current criminal law uses the intent of a human actor as the primary basis for establishing criminal liability, the future criminal law should consider both hybrid subject/object and there should be a shared responsibility for establishing criminal liability (as well as the creation of a 'good' life) by both human(s) and non-human(s) through a structured democratic process.

In recent times, the nature of criminal law as a resolution to social issues has become distressed and debated by normativity and subsequently labelled for scrutiny by those supporters of an alternative model of social control other than the system. As opposed to the element of virtue or ethical clarity, many social scientists and advocates view criminal law to exhibit elements of racial subjection, social inequity and the prevalence of brutal and oppressive institutional practices. In this article [8], I celebrate the emergence of these critical social science scholars studying various criminal procedural systems.

However, the critical assessment of contemporary criminal processes presents serious concerns regarding structures of political power and rule within our communities; therefore, these issues must be examined beyond the civil versus criminal law dichotomy, and in certain instances, even beyond the public versus private sphere distinctions. If the failure of the criminal law is not solely due to its criminality but, rather, to the fundamentally flawed thinking and ideals that provide a foundation for the structure of our society and the manner in which we expect to be governed, then the problems of the criminal justice system may simply serve as a reflection of broader societal issues rather than being inherently unique to criminals.

During the 1960s and 1970s [9], many states throughout the nation were undergoing criminal law revision as was never seen in this nation before. Influenced by the Model Penal Code developed by the American Law Institute, more than two-thirds of all states have adopted entirely new and complete criminal codes. However, since that time, there has been little movement toward further development or refinement of American criminal codes. To make matters worse, changes to criminal codes over the last generation have diminished rather than enhanced previous useful reforms. In general, over the past 30 years, there has been a significant and steady decline in the quality of nearly all criminal codes in this country.

Modern theories about desert and proportionality were initially developed during the 1970s to address societal concerns related to racial disparities, unfairness in legal processes (procedural justice), and belief regarding the ineffectiveness and injustice of rehabilitative services. Current policymakers, practitioners, and the general community do not appear to be influenced by any of these issues that were so prominent more than 30 years ago. Thus, punishment theories have not moved beyond the 1970s [10]; they continue to be concerned with issues that were prevalent in the 1970s while being unable to adequately address more recent developments such as the increased interest in restorative and community justice models, a resurgence of confidence that rehabilitative services are both effective and appropriate to use as a means to change offenders, and the growing numbers of drug and other specialty courts established for the purpose of changing offenders. Punishment theories may have some limited influence on policies made by policymakers, but much more often they serve to provide understanding as to how policy choices will impact the use of punitive measures on offenders.

The national effects of this legislation will have far-reaching effects [11]. There are 15 other states besides DC that have not gone through MPC style revisions to their statutes and many other states with MPC based systems have gone through significant degradation requiring the need for comprehensive reviews of their respective codes. After decades of failed attempts to reform the criminal code in the District, DC established an independent agency specifically dedicated to rewriting the again established the Revised Criminal Code of 2022, which embraces the core principles of the Model Penal Code and represents the only comprehensive update to the Substantive Criminal Laws District since Congress wrote the D.C. Code in 1901. The legislative focuses during debate included penalty changes, misdemeanor jury trial right creation, and sentence modification on longer term sentences; other than these specific areas all other Main Penal Code provisions have been accepted without objection, along with hundreds of other proposed penalties and liabilities.

An example of a contemporary racial justice movement, the Movement for Black Lives has an intersectional political agenda as it relates to race, gender, and class. The vision of radical social movements represents a different way of knowing and addressing structural inequalities [12]. Studying the critics of radical social movements and the visions of both radical and antiracist social movements will open up the law scholarship to more expansive critiques of historical and continuing injustices; studying the radical critiques of social movements and visions can push the edges of law scholarship; studying the radical vision of social movements to expand the historical

record of colonialism, settler colonization, the transatlantic slave trade, and the mass incarceration of people of color will result in bolder and more effective projects for transformation.

The faculty ran the quarterly journal exclusively for the first 40 years of publication, but in the '70s a student editorial board was incorporated bringing about a large amount of faculty involvement still [13]. Each issue is then much like every other issue, with published material being related to a particular subject or topic of current interest, and usually consists of a variety of interdisciplinary contributions from lawyers, economists, social scientists, etc. On occasion, student notes are published in Law and Contemporary Problems that were presented at previous symposiums. General university libraries, government agencies, foreign universities, etc., and traditional law libraries or law firms are some of the contributors to Law and Contemporary Problems. The journal has a general editor and Faculty Advisory Committee that supervises the publication.

3. METHODS AND MATERIALS

3.1 What is the model penal code?

When determining whether to make changes to a document or organization, we must first identify and confirm what it is we want to change. After determining whether or not the organization is fulfilling its purpose well, we must identify what purpose it is supposed to be fulfilling. The Model Penal Code serves many functions; however [14], I think that because the audience of the Model Penal Code is considered primarily to be academics today, there may be some members of that audience who do not fully appreciate the main intent of the drafters of the Model Penal Code and how it has historically functioned. In addition, everybody who studies criminal law knows that the Model Penal Code is considered by many to be one of the great intellectual achievements of American legal scholarship during the mid-20th century. Furthermore, it can be said that the Model Penal Code represents the culmination of a long-term effort (since 1937) to reinterpret and systematize the substantive criminal law of the United States through an analysis of the common law of crimes as articulated in Wechsler and Michael's Art. 3 of the Model Penal Code of Homicide" Thus far, this has been celebrated as one of the most important law review articles written in the last 100 years. Over the course of several hundred years, common-law development with regard to criminal law has gone through many different phases. The common law evolved to form a common foundation from which many nations would adopt statutes and procedural rules with the purpose of providing a structure to legal practice for all cases. The drafters of the Code carried out this work in an intellectually systematic way. In addition to their intelligence and hard physical work, the drafters of the Code were assisted by a passionate determination to create a body of rules that all jurisdictions could use, therefore making them easier for various levels of government to implement. They used the years of experience accumulated by the judges who had dealt with the problems of uncontrolled human passion and intelligence in both a destructive and violent manner to derive the underlying principles of criminal law.

This is very important. Much of the ALI's other significant work has created restatements of the common law—general principles stating the state of the common law, which can be referenced by judges when making case-to-case decisions, and which will be revised/re-stated as the case law evolves. In contrast, the Model Penal Code was developed as a model statute, a true code, and intended to be adopted, with state-by-state changes to accommodate particular state circumstances, by legislatures across the U.S [15].

Therefore, the roots of the Model Penal Code extend to the codification movement of the beginning of the 19th century and it's one of the final great codes that replaced mostly all of judicial

Artificial Intelligence and the Radical Overhaul of Penal Codes: Challenges for Modern Criminal Justice

law-making in many major areas (e.g. procedure, commercial law, evidence) from the 19th and into the 20th centuries. This acknowledgment, however, sheds light on another unique feature of the Model Penal Code. The Model Penal Code is not a "monument" to legal scholarly work but also one of the most effective legal reform initiatives in U.S. history. It did not just sit on a law library shelf for other lawyers to read but instead initiated a legislative movement that continued for more than a decade. The MPC produced revised and modernized penal codes in the vast majority of states which were easily identifiable as being derived from Wechsler and colleagues work, and virtually all of which incorporated the overall structure and many of the different formulations they created [16].

3.2 Disciplinary Perspectives

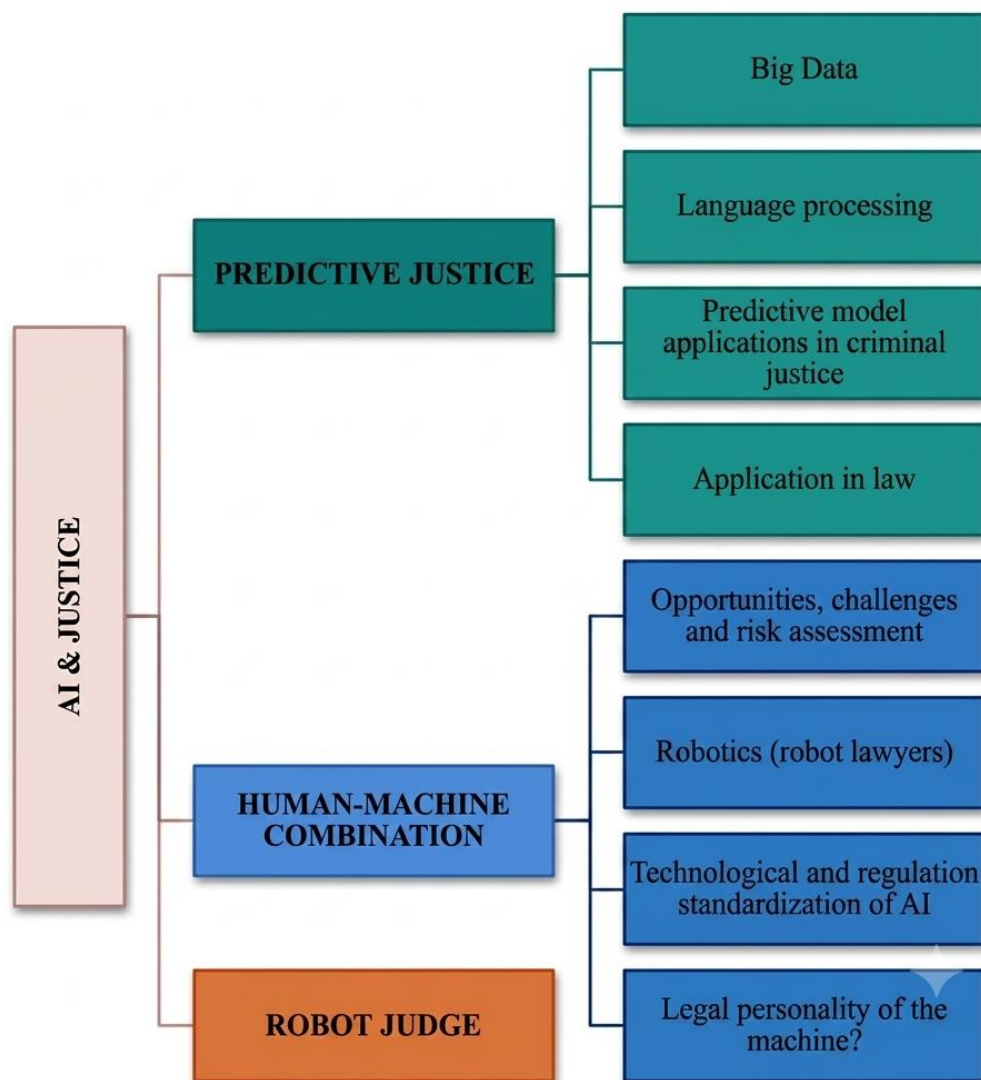


Figure 2. Macro-areas describing interesting topics in AI and justice

Three primary thematic macro-areas for characterizing the relationships and interactions between AI and justice were identified by our study of the articles as shown in Figure 2. These are connected to predictive justice [17], the mixing of humans and machines, and the developing and contentious technology of the robot judge.

4. IMPLEMENTATION AND EXPERIMENTAL RESULTS

4.1 Human–Machine Combination

In the various fields of the judiciary, the interaction between humans and machines is manifested through a mixture of digitalisation of procedures (eg, PCT electronic civil process; PAT electronic administrative process); with these digitalised procedures, the management of the decisions made will increasingly be done through the connubia of the human-machine relationship [18]. The machine will facilitate and guarantee the completion of the very complex decision-making issues of a judicial process through the mere entry of data into the system within a neutral, effective and efficient manner; and the human component will be responsible for the operation of the machine and compliance with the basic principles of sorting. In addition [19], the human component will ensure that the algorithm is employed in such a manner as to provide proper risk assessment in its use. In this section, I will provide an introduction to and discussion of several topics regarding the combination of the human-machine relationship in justice systems.

4.2 Robot Judge

A “robot judge” will mean different things to different people. First of all, it may mean a type of AI system that assists judges with their decisions about the law (like an algo-type), where the AI analyzes the cases and provides suggested resolutions. The key aspect here is that the final decision about the case (who wins/loses) will still lie with the judge and not with the AI, which acts as support for the final decision.

The applications for these first-level predictive algorithms, chatbots, robot lawyers, etc, are limited strictly to being decision support systems (including AI assistants) and still have to be supervised and managed by a human being. However, it could also mean that judges will be fully replaced by AI in the courtroom through some futuristic technology, and this raises many issues regarding the ethics, practicality, and legality of what a legal system will do to manage this new type of system, and how to guarantee transparency, fairness, and accountability. As such, the majority of judges in most current judicial systems (where the judges are humans) can be classified as irreplaceable due to the complexity of making legal decisions and the human element involved (empathy, discretion, compassion, etc.).

When evaluating possible future developments of LegalAI systems in line with future evolution, it is critical that certain prerogatives are adhered to avoid the risks associated with discrimination and unjustified evaluation based upon the inherent opacity and ethical deficiency of AI [20]. The concept of “robot judges” will be discussed as a replacement for human judges, as opposed to being mere assistants for AI. There are many signs that suggest that many of the future decisions which will be made will be made by machines, rather than people; and the increased use of AI for decision making brings significant issues with regards to the foundational elements of democracy and the fairness of the algorithms which will be used to reach those decisions. In order to restore trust in AI for humanity, we must develop AI systems using design principles which include core elements of judicial oversight as part of AI architecture; and this is a crucial factor to consider in the development of a future where robot judges are actually operating. Overall, the issues associated with robot judges and their potential for partiality or discrimination is on two levels: one related to science and technology, the second related to law and governance.

5. DISCUSSION

5.1 Justice 5.0, a New Concept of Legal AI, and the Ramifications for Humanity

Three major themes regarding the integration of smart technologies in the justice system were highlighted in the literature review, and these themes will drastically change the current landscape: (1) implementation of predictive justice tools, (2) the interplay between human and machine interaction, and (3) the rise of robotic judges. Thus far, the discussion of the literature review's findings has mostly remained at the micro level with respect to the integration of these technologies into the justice system. However, to fully understand the pervasive impact of disruptive technologies on the justice system, this summary must also take into consideration the larger evolution of society due to advanced technology and how this culminates in the concept of Society 5.0, which was introduced by the Japanese Government in January 2016. According to Society 5.0, the future of humanity's society will be created from innovations produced by technology and science. The focus will be to create a society that is people-oriented, a society that has the highest intelligence available, and creates the most efficient environment. The goal will be that every person has the opportunity to live a high quality, comfortable, and vibrant life, with all of the products and services needed to do this delivered quickly and at the desired level by creating a seamless integration between cyberspace and physical space. There have been four different eras of transformation in human history: from the beginning of society as hunter-gatherers, to the development of the agricultural, industrial, and now information societies. We are currently in the process of transforming into the supersmart, human-centric society of Society 5.0. In parallel, the development of the Industrial Revolution (Society 3.0) occurred in four phases with rapid advances in technology moving through human history. At present, humanity is about to transition into a new industrial era called Industry 5.0. It is significant that the last two of these four phases of the industrial revolution correspond closely with the advancement of technology in the last two decades and have had an impact on every sector of society.

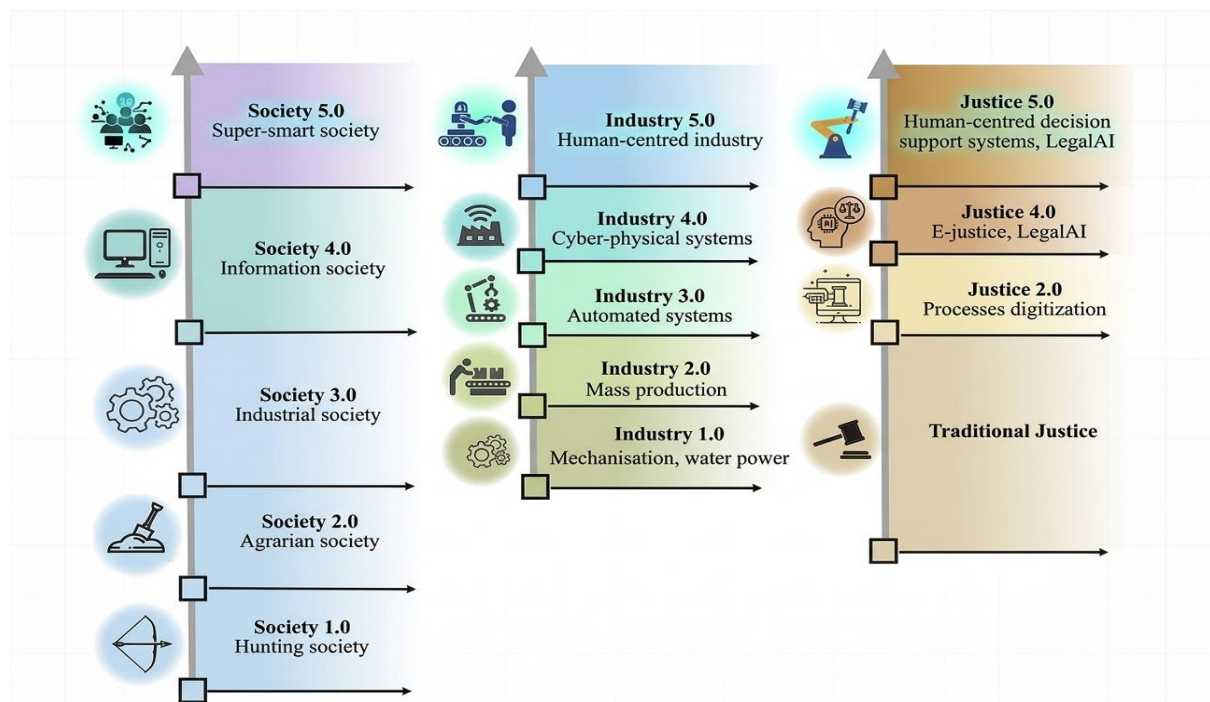


Figure 3. Society, Industry and Justice 5.0 Evolution

There is significant evidence that advancements in technology from the last two phases of the Industrial Revolution have changed significant sectors of society, thus resulting in the

emergence of paradigms such as Tourism 4.0, Agriculture 4.0 and Health Care 4.0. These new paradigms are also seen as impacting the area of justice, as demonstrated by the development of e-justice, which has been referred to as Justice 4.0, as seen in Figure 2.

6. CONCLUSION

Through a PRISM study of the literature, the study demonstrated that AI innovations have great potential in law with many areas of AI law in need of further research. More specifically, this research provides many new questions that need to be answered to understand how the application of different types of AI innovation will expand within the justice system in addition to many critical issues that will affect the current and future justice systems. Overall, the pervasive nature of AI innovations will continue to grow throughout the entire society as discussed within an overview of AI innovations within a framework of the 5th Industrial Revolution.

REFERENCES

- [1] Southerland, V. M. (2021). The intersection of race and algorithmic tools in the criminal legal system. *Maryland Law Review*, 80(3), 487.
- [2] Carreras, A. D. D. (2020). The moral (un) intelligence problem of artificial intelligence in criminal justice: A comparative analysis under different theories of punishment. *UCLA Journal of Law and Technology*, 25(1), 1.
- [3] Southerland, V. M. (2021). The intersection of race and algorithmic tools in the criminal legal system. *Maryland Law Review*, 80(3), 487.
- [4] Piparo, C., & Blažek, R. (2024). Criminal algorithms and their punishment in modern constitutionalism. *Bratislava law review*, 8(2), 199-222.
- [5] Szilagyí, K. (2022). *Artificial Intelligence & the Machine-ation of the Rule of Law* (Doctoral dissertation, Université d'Ottawa/University of Ottawa).
- [6] Wisnubroto, A., & Tegan, H. (2025). Preventing AI crime towards a new legal paradigm: Lessons from United States. *Journal of Human Rights, Culture and Legal System*, 5(2), 630-658.
- [7] Becher, S., & Alarie, B. (2025). LexOptima: The promise of AI-enabled legal systems. *University of Toronto Law Journal*, 75(1), 73-121.
- [8] Tolbaru, C. E. (2025). Artificial Intelligence—a Vector for Crime and a Tool for Carrying Out Criminal Justice. *Athens JL*, 11, 461.
- [9] Wisnubroto, A., & Tegan, H. (2025). Preventing AI crime towards a new legal paradigm: Lessons from United States. *Journal of Human Rights, Culture and Legal System*, 5(2), 630-658.
- [10] Radavoi, C. N. (2020). The impact of artificial intelligence on freedom, rationality, rule of law and democracy: Should we not be debating it. *Texas Journal on Civil Liberties & Civil Rights*, 25(2), 105-127.
- [11] Tolbaru, C. E. (2025). Artificial Intelligence—a Vector for Crime and a Tool for Carrying Out Criminal Justice. *Athens JL*, 11, 461.
- [12] Ilhan, M. A. (2025). *Predictive Artificial Intelligence Tools in the US Criminal Trial: Reflections on Technology and Justice* (Doctoral dissertation, Université Côte d'Azur).
- [13] Khatun, S. (2025). Strategising Algorithm: The Prospects and Perils of Artificial Intelligence (AI) in Criminal Justice Reformation.

-
- [14] Haley, P., & Burrell, D. N. (2025). Integrating Artificial Intelligence into Law Enforcement: Socioeconomic and Ethical Challenges. *SocioEconomic Challenges (SEC)*, 9(2).
- [15] Katyal, S. (2026). Private accountability in the age of artificial intelligence. *arXiv preprint arXiv:2601.17013*.
- [16] Ovchinnikov, S. N. (2025). On Application of Digital Technologies in Penal Enforcement: Trends, Innovations, Risks. *Пенитенциарная наука*, 19(3 (71)(eng)), 261-269.
- [17] Ezeji, C. L. (2025). Smarter corrections and intelligence-driven innovations in correctional services in contemporary society. *International Journal of Business Ecosystem & Strategy* (2687-2293), 7(6), 244-262.
- [18] Widjaja, G. (2026). LEGAL TRANSFORMATION IN THE AGE OF ARTIFICIAL INTELLIGENCE: A LITERATURE REVIEW ON REGULATORY, ETHICAL AND DATA PROTECTION CHALLENGES IN INDONESIA. *INJOSEDU: International Journal of Social and Education*, 3(2), 168-182.
- [19] Segate, R. V. (2024). Exposing, Reversing, and Inheriting Crimes as Traumas from the Neurosciences to Epigenetics: Why Criminal Law Cannot Yet Afford A (nother) Biology-induced Overhaul. *Criminal Justice Ethics*, 43(2), 146-193.
- [20] Liu, H. Y., Maas, M., Danaher, J., Scarcella, L., Lexer, M., & Van Rompaey, L. (2020). Artificial intelligence and legal disruption: a new model for analysis. *Law, Innovation and Technology*, 12(2), 205-258.