The Role of Artificial Intelligence in Revolutionising Criminal Justice: Opportunities and Challenges for Nigeria

Feranmi Adeoye*

Abstract

Artificial intelligence (AI), comprising machine learning and analytical algorithm-based systems, has emerged as a transformative force in the criminal justice sector across the world, revolutionising traditional practices and enhancing efficiency for all stakeholders, including law enforcement agencies, the judiciary, legal practitioners, correctional institutions, and policymakers. While criminals are deploying AI to actualize new possibilities in the commission of crimes, criminal justice stakeholders are also actively integrating AI into their crime control and prevention strategies. AI is increasingly being deployed to automate repetitive tasks, streamline processes, and handle vast amounts of data, resulting in more efficient case management and faster resolution of criminal cases. It makes data-driven decision-making possible through algorithms that can analyse large datasets, identify patterns, and provide insights for quick and quality decision-making by stakeholders. It has become important to amplify a conversation on the potential opportunities and challenges that Nigeria may face while adopting AI to revolutionise its criminal justice sector. This article explores these opportunities and finds that some of the challenges limiting the development include concerns about privacy and data security, a lack of requisite training and expertise in handling AI systems, scepticism from stakeholders, and potential biases in AI algorithms, among others. It argues that the technical and ethical concerns associated with AI should not be ignored in order to build public trust and confidence in its integration. Conclusively, it recommends that collaborative efforts among all stakeholders are indispensable in charting a sustainable path towards leveraging AI for a more efficient criminal justice system.

Keywords: Artificial Intelligence, Criminal Justice, Justice Stakeholders

* LL.B (Akungba), B.L (Lagos), MSc (University of Reading, in view) adejics@gmail.com (Co-founder, Briefed Legal Tech, Commonwealth Shared Scholar 2023)

1. Introduction

Artificial intelligence (AI), which was originally rooted in science fiction, is now an indispensible reality that has a remarkable impact on almost every facet of human activities. AI research over the past three decades has proliferated rapidly, such that AI now competes with human performance while superceding in some areas.[1] For instance, in 2016, AlphaGo became the first computer programme to defeat Lee Se-dol, the world's best player in the complex mental game of GO, which has been played for about three thousand years in China and is often considered difficult and beyond the capabilities of available technology.[2] AI represents an extensive domain of multifaceted endeavours focused on creating intelligent machines, or "cognitive technologies," that have practical benefits for several spheres of human activity.[3] Regardless of the nomenclature, the field encompasses numerous branches, each with notable interconnections and shared characteristics. AI is applicable to several sectors of society, ranging from criminal justice, public safety, manufacturing, industry, communications, government service, transportation, and medicine.

In terms of criminal justice, modern realities show that crime has gotten more complex as criminal entities now deploy high-tech strategies to perpetrate illegal activities and infuse the latest trends in technology, such as cryptocurrencies or virtual reality.[4] The apprehension regarding discrepancies between offenders and law enforcement has necessitated the readiness of criminal justice systems to harness cutting-edge technologies like AI to enhance crime prevention and management. Precisely, AI is utilised as an application in law enforcement and judicial systems, yielding

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1 Grace K, Salvatier J, Dafoe A, Zhang B, Evans O. 'Viewpoint: When Will AI Exceed Human Performance? Evidence from AI Experts' (2018) 62 Journal of Artificial Intelligence Research 729.

2 Borowiec S, 'Google's AlphaGo AI defeats human in first game of Go contest' (29 November 2017) The Guardian <https://www.theguardian.com/technology/2016/mar/09/google-deepmind-alphago-ai-defeats-human-lee-sedol-first-game-go-contest> accessed July 28, 2023.

3 Michael Mills 'Artificial Intelligence in Law: The State of Play 2016.' (2016, Thomson Reuters Institute) <https://www.thomsonreuters.com/en-us/posts/legal/artificial-intelligence-in-law-the-state-of-play-2016/> Accessed 29, July 2023.

4 Asma Idder & Stephane Coulax, 'Artificial Intelligence in Criminal Justice: Invasion or Revolution (2021, International Bar Association) <https://www.ibanet.org/dec-21-ai-criminal-justice#_edn3> accessed 29, July 2023.

improved and expedited outcomes with minimal room for error owing to its independence from human intervention.[5] This development is often backed by the pressure to address overwhelming criminal justice needs and the perception that technological solutions are cost-effective, reliable, and impartial.[6] Many countries are already deploying AI to improve their criminal justice system. For instance, the AI technology "Rosie" is being used in Brazil to find evidence of corruption and atypical spending by the nation's elected representatives. Law enforcement in the United Kingdom are already makes use of face recognition technology (FRT) and automated licence plate scanners (ALPR) to track suspects in real time.[7]Correctional Offender Management Profiling for Alternative Sanctions (COMPAS), an AI-based predictive analytics tool, has been used by courts in the US to estimate the chance that a defendant would commit another crime after being released on bail.[8]

In an attempt to examine these positive outcomes, flowing from the integration of AI into some criminal justice systems in advanced climes, it is very important to also balance the discussion by identifying inherent threats or challenges posed by the application of AI to criminal justice. For instance, studies in jurisdictions like Europe present major evidence showing that AI and machine-learning systems exert a substantial negative influence on criminal justice as they directly produce or perpetrate unjust or discriminatory results that violate human rights and fail to enhance the quality of human decision-making.[9] Many AI systems used in criminal justice depend on statistical modes that consist of data that reflect structural biases and inequalities that are prevalent within the societies

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5 Ibid.

6 Fair Trails 'Regulating Artificial Intelligence for Use in Criminal Justice Systems in the EU Policy Paper' (2022) <https://www.fairtrials.org/app/uploads/2022/01/Regulating-Artificial-Intelligence-for-Use-in-Criminal-Justice-Systems-Fair-Trials.pdf> Accessed July 31, 2023.

7 Hersey F, 'British police deploy live facial recognition, license plate recognition to make 11 arrests' (2022) Biometric Update <https://www.biometricupdate.com/202207/british-police-deploy-live-facial-recognition-license-plate-recognition-to-make-11-arrests> accessed August 1, 2023.

8 Mahmud H, 'AI: The future of crime prevention?' (24, September 2022) The Business Standard News <https://www.tbsnews.net/tech/ai-future-crime-prevention-502290> accessed 31 July 2023

9 Ibid.

represented. Most of this data is gotten from criminal justice systems, including law enforcement or crime records, and is not an accurate representation of criminality but rather a record of law enforcement locations, activities, and targeted groups.[10] An instance was the attempt to create a Top 600 list in the Netherlands, which predicted the category of young people that could perpetrate high-impact offences. The predictive system was highly criticised, as one in three of the 'Top 600' are of Moroccan descent, and many of them have reported being harassed by police.[11]

While the foregoing holds true in jurisdictions that are quick to adopt AI to revolutionise their criminal justice systems, the uptake of AI integration in Nigerian criminal justice is still largely low, notwithstanding the increased rate of discussion of AI applications among young stakeholders. This research is structured to cover this subject matter to a great extent. The first part examines the definition of key terminologies, after which the various applications of AI to criminal justice are discussed with practical examples in different countries across the world. The third part considers the various opportunities that Nigeria can explore in the implementation of AI by its criminal justice stakeholders. Thereafter, an attempt is made to examine the challenges and concerns that should be addressed to avert the negative consequences of not properly integrating AI applications. Lastly, certain recommendations are made to ensure that AI is optimally deployed for positive criminal justice outcomes.

2. Definition of Terms

Artificial Intelligence (AI)

There have been diverse attempts to conceptualise AI by scientists and academic researchers. In the middle of the 20th century, British mathematician and logician Alan Turing, who is best known for decrypting the German Enigma machines' encryption during World War II, started the first substantial research into artificial intelligence.[12] Turing, who is credited as one of the creators

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10 Ibid.

11 Fair Trials, 'Artificial intelligence (AI), data and criminal justice' (2023) <https://www.fairtrials.org/campaigns/ai-algorithms-data/> accessed 31 July 2023.

12 Asma Idder & Stephane Coulax (n 4).

of computer science and artificial intelligence, was the first to consider the possibility that computers may use information to mimic human decision-making and problem-solving.[13] The phrase "artificial intelligence" was subsequently coined by renowned US researcher and math professor John McCarthy, who described it as the "science and engineering of creating intelligent machines."[14] Over the years, it has become apparent that a consensus definition of AI defies its multidisciplinary character, as it encompasses multiple methodologies from sociology, cognitive sciences, and mathematics.

Patrick and Gupta conceived of AI as "the ability of a system to identify, interpret, make inferences from, and learn from data to achieve predetermined organisational and societal goals."[15] According to this definition, any type of manufactured system that can independently produce insights and/or take action based on them in order to accomplish a set of goals qualifies as an AI application. However, a similar but more comprehensible and typical modern definition is the European Commission's 2018 definition,[16] which considers AI as systems that exhibit intelligent behaviour by assessing their surroundings and acting with some autonomy to accomplish predetermined goals. Expert systems, natural language processing, speech recognition, and machine vision are some examples of specific AI applications.[17] Meanwhile, greater accuracy is needed in order to have fruitful and productive discussions on AI because it encompasses so many different methodologies and

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13 A M Turing, 'Computing Machinery and Intelligence' (1950) Mind 49: 433-460. Computing Machinery and Intelligence, www.csee.umbc.edu/courses/471/papers/turing.pdf accessed August 1, 2023.

14 John McCarthy, 'What is Artificial Intelligence'. Society for the Study of Artificial Intelligence and Simulation of Behavior, Computer Science Department, Stanford University, 2007. <http://jmc.stanford.edu/articles/whatisai/whatisai.pdf> accessed August 2, 2023.

15 Mikalef P, Gupta M, 'Artificial intelligence capability: Conceptualization, measurement calibration, and empirical study on its impact on organizational creativity and firm performance' (2021) 58 Information & Management 103434 https://doi.org/10.1016/j.im.2021.103434.

16 Phillip Boucher 'Artificial intelligence: How does it work, why does it matter, and what can we do about it?' https://www.europarl.europa.eu/RegData/etudes/STUD/2020/641547/EPRS_STU(2020)641547_EN.pdf

17 Abdoullaev A, 'On the EC's definition of AI, or How to define Artificial Intelligence as real and concerned with essence of Intelligence' (2019) FUTURIUM - European Commission https://ec.europa.eu/futurium/en/european-ai-alliance/ecs-definition-ai-or-how-define-artificial-intelligence-real-and-concerned.html

circumstances.[18] Arguments regarding straightforward "expert systems" that provide advising functions, for instance, must be separated from those about sophisticated data-driven algorithms that automatically draw conclusions about specific people.[19] Similar to this, it is crucial to differentiate arguments about hypothetical future advancements from those regarding actual AI that already has an impact on society today.[20] Notwithstanding all these differences, it is submitted that one essential characteristics of AI is the replication of human intellectual functions by machines, particularly computer systems.

Criminal Justice System

Criminal justice, as used in this research, is the term used to describe the process by which justice is administered to those who have committed crimes and those who are victims of crimes.[21] It covers the alleged offence a defendant committed, the law enforcement personnel who detained such an offender, the legal system that prosecutes and defends the individual, and the punishment the defendant would get if found guilty of a criminal offence. To uphold the rule of law in a society, legal practitioners, law enforcement agencies, the judicial system, and correctional services all collaborate at different stages of criminal justice.[22] Along this line, Crowder and Turvey considered the criminal justice system to be a collection of public and private organisations set up to handle criminal suspects and offenders who have been found guilty of criminal offences.[23] It consists of a set of government organisations that aim to "apprehend, prosecute, punish, and rehabilitate criminal offenders."[24] At a broader level, civil society organisations, academia, and even the entire public are also several interconnected

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18 Asma Idder & Stephane Coulax (n 4).
19 Ibid.
20 Ibid.
21 Stephanie Johnson, 'Criminal Justice & Criminology: What is criminal justice? and What is criminology?' (2023, Heinonline) https://libguides.heinonline.org/criminal-justice-and-criminology.
22 Ibid.
23 Stan Crowder, Brent E. Turvey, 'Chapter 1 - Ethics in the Criminal Justice Professions' in Brent E. Turvey, Stan Crowder (eds), Ethical Justice (Academic Press 2013) 1-19. ISBN 9780124045972. https://doi.org/10.1016/B978-0-12-404597-2.00001-2.
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pillars that make up the criminal justice system. These pillars are designed to uphold the principles of legal justice, which are based on the government's responsibility to uphold and safeguard the rights of every individual.

3. AI Applications in Criminal Justice

The field of criminal justice has increasingly adopted AI to enhance its results, combat crime, and expedite justice processes. AI applications are evident in law enforcement and court proceedings in many countries, serving as a means of prevention, prediction, crime resolution, and managing recidivism, which is the tendency of a convicted criminal to commit another offence. The applications are considered under each catergory criminal justice stakeholders.

A. Law Enforcement Agencies:

Law enforcement agencies, investigators, and prosecutors can utilise AI in diverse ways during investigation and prosecution or for crime prevention and control. Some of the areas include predictive policing, facial recognition, crime pattern analysis, victim identification, gunshot detection, forensic analysis, crowd monitoring, and emergent response for public safety and security.

Tools for predictive policing are developed by feeding data, such as arrest records, crime reports, and licence plate photos, to an algorithm that has been trained to look for trends in order to forecast where and when a specific kind of crime will take place in the future.[25] In predictive policing, AI can also be used to pinpoint high-crime regions and anticipate probable criminal activity so that resources may be allocated there for crime prevention and control. This is similar to crime pattern analysis, where AI is used to analyse crime patterns and trends for strategic decision-making.[26]

AI-powered facial recognition systems help identify suspects and missing people from surveillance footage.[27] AI facial recognition

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[25] Yang F, 'Predictive policing' in Oxford Research Encyclopedia of Criminology and Criminal Justice (2019) https://doi.org/10.1093/acrefore/9780190264079.013.508

[26] Ibid.

[27] Samuel D Hodge Jr, 'The Legal and Ethical Considerations of Facial Recognition Technology in the Business Sector' (2022) 71 DePaul L Rev 731 https://via.library.depaul.edu/law-review/vol71/iss3/2

analyses bodily motions, bone structure, clothes, and facial features to identify individuals who exhibit unusual or suspect behaviour, such as shoplifters or reckless drivers who violate the law.[28] AI programmes are trained to read licence plates even in low-light conditions or with poor resolution, which aids in vehicle identification. It is also useful for victim identification, such as in cases of human trafficking or other crimes. Several countries, like the Canadian police, have already approved these AI applications in law enforcement.[29] AI applications for analysing DNA, fingerprints, and other evidence are used to make forensic analyses for criminal investigations. When used for digital forensics, its major purpose is to extract and analyse digital evidence from electronic devices.[30]

Another extension of the use of AI for public safety and security is its ability to position law enforcement agencies for emergency response through accurate analysis of emergency calls and the dispatch of appropriate response units more efficiently. Through this, the police are using AI techniques to prevent crimes before they happen and to investigate them after they have occurred. Preventive methods entail the use of automated techniques to analyse enormous volumes of data and detect prospective offenders, either by focusing on specific people (heat lists) or dangerous areas (hot spot policing).[31] The International Child Sexual Exploitation Picture Database (ICSE DB), managed by Interpol in Europe, however, uses AI to identify victims and abusers using picture analysis, making it an effective application of AI in the fight against human trafficking.[32] Additionally, chatbots acting like real humans, such as the 'Sweetie' virtual character used by a Dutch children's rights organisation, have been used to combat webcam child sex tourism, and work is being done to create AI systems that can perform the same functions as

28 Ibid.

29 Kenyon M, 'Algorithmic Policing in Canada Explained' (2021) The Citizen Lab https://citizenlab.ca/2020/09/algorithmic-policing-in-canada-explained/ accessed July 3, 2023.

30 James Byrne and Gary Marx, 'Technological Innovations in Crime Prevention and Policing: A Review of the Research on Implementation and Impact' (2011) Cahiers Politiestudies Volume 2011-3, Issue 20, 17-40

31 Ibid.

32 Ibid.

Sweetie to discourage and detect offenders without human interaction.[33]

B. Courts of Criminal Jurisdiction:

Courts, in making decisions, also use AI algorithms to determine whether offenders who are awaiting trial or those who are out on bail and parole pose a flight risk or are likely to commit another crime. The majority of AI software in this field is now employed in the USA. For instance, the 1.5 million criminal cases used by the Arnold Foundation algorithm, which is now in use in 21 US jurisdictions, are used to forecast the behaviour of defendants before trials.[34] In Florida, bail amounts are determined using machine-learning algorithms.[35] Based on 1.36 million pre-trial detention cases, research showed that AI could predict flight risk and re-offending better than human judges.[36] Several European countries use automated decision-making systems to administer the judicial system, notably for allocating cases to judges and other authorities. Estonia is looking into the idea of a robot judge to handle minor claims cases where parties could upload pertinent evidence, and an AI would then issue a ruling that would be subject to review by a human court.[37]

AI is also often used in legal proceedings for other purposes. By processing low-level or degraded DNA evidence that was inadmissible several years ago, AI is advancing forensic laboratories and investigators in DNA testing and analysis via crime-solving and from a scientific perspective.[38] Additionally, decades-old cases, that were abandoned without justice served, have been revived in order to provide cold-case evidence for the identification of the perpetrators of homicide and sexual assault.[39] Such AI applications improve

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33 Van Der Hof S, Georgieva I, Schermer B, and Koops B, 'Sweetie 2.0' in Information Technology & Law Series (2019) https://doi.org/10.1007/978-94-6265-288-0

34 Završnik A, 'Criminal Justice, Artificial Intelligence Systems, and Human Rights' (2020) 20(4) ERA Forum 567–583 https://doi.org/10.1007/s12027-020-00602-0

35 Ibid.

36 Ibid.

37 Izdebski, K 'alGOVrithms—State of Play' (2019) ePaństwo Foundation <https://epf.org.pl/en/projects/algovrithms/> accessed July 30, 2023

38 Asma Idder & Stephane Coulax (n 4).

39 Ibid.

public confidence in justice by reducing unsolved crimes.[40] Predictive justice is another use of AI that involves statistically analysing a lot of case law data, mostly previously given court decisions, in order to forecast court outcomes. Through this, judges may be able to concentrate their efforts on situations where their knowledge is more useful. In the long-term, it can increase the predictability of court rulings, which will promote justice stability in various criminal jurisdictions across the world.[41]

AI-powered technologies aid judges and legal practitioners with case law analysis, precedent analysis, and legal research.[42] This is not just limited to the courts, as law enforcement and legal professionals are also able to better understand complicated information with the help of AI-driven data visualisation tools. AI-powered case management solutions streamline and automate administrative chores, resulting in less paperwork and more productivity.[43]

C. Corrections and Rehabilitation:

New technologies are being employed more and more, in the post-conviction phases, notably in prisons, to enhance and automate security and support prisoner rehabilitation. An AI network is being placed in a well-known Chinese jail to identify inmates and monitor them around the clock, alerting guards to any questionable conduct.[44] AI-powered programmes may offer tailored instruction and training to prisoners, assisting them in learning new skills and becoming ready for life after incarceration, this is used in Finnish prisons.[45] AI may also be used to monitor an inmate's development and spot any areas that could require further help. Some academics even consider employing artificial intelligence (AI) smart assistants, like Alexa

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40 Ibid.
41 Ibid.
42 Faggella D, 'AI in Law and Legal Practice – A Comprehensive View of 35 Current Applications' (2021) Emerj Artificial Intelligence Research https://emerj.com/ai-sector-overviews/ai-in-law-legal-practice-current-applications/> accessed 4, August, 2023.
43 Ibid.
44 McKay C, 'The Carceral Automaton: Digital Prisons and Technologies of Detention' (2022) 11(1) International Journal for Crime, Justice and Social Democracy 100-119 https://doi.org/10.5204/ijcjsd.2137
45 Ibid.

from Amazon, to address the problem of solitary confinement in the USA.[46]

In correctional centres and rehabilitation homes, AI is used for risk assessment, such that the algorithms are deployed to assess the risk of recidivism among offenders and inform decision-making on pre-trial detention, sentencing, and rehabilitation programmes.[47] The criminal justice system employs a number of risk assessment techniques, each of which has strengths and weaknesses.[48] Concerns regarding bias and injustice have been expressed in relation to the contentious Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) system used in the USA, which was created without the public's input and the participation of the judiciary.[49] It was created by a private business (Northpointe Corporation), and has been found to be mostly unfavourable to African-Americans. However, Public Safety Assessment PSA) used in deciding whether a person should be released on bail or not, has been considered more reliable.[50] In Israel, the Intelligent Decision Support System (IDSS) is well-known for its use by judges in reaching sentencing decisions in traffic situations. It has been suggested that a Nigerian Risk Assessment System (NIRAS) be built openly, beginning by concentrating on small violations and employing data reduction to prevent biases.[51]

*D. **Legal Services and Defence:***

AI is assisting lawyers to make significant improvements in criminal law practise. AI-powered legal research tools make it

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46 Picott I, 'The Rise of AI-Run Prisons: A Look into the Future of Correctional Facilities' (2023) <https://medium.com/@ceoishhh/the-rise-of-ai-run-prisons-a-look-into-the-future-of-correctional-facilities-dd9b29b36aa0> accessed July 30, 2023

47 James Redden, Christopher Inkpen, and Matthew DeMichele, 'Artificial Intelligence in Corrections: An Overview of AI Applications and Considerations for Systems Administrators and Policy Makers' (2020) National Institute of Justice https://nij.ojp.gov/library/publications/artificial-intelligence-corrections-overview-ai-applications-and

48 Akin Agunbiade, 'How Artificial Intelligence Could Decongest Nigerian Prisons' (2022) Medium, DigiLaw https://medium.com/@DigiLawNG/how-artificial-intelligence-could-decongest-nigerian-prisons-4c33fec5c02d

49 Ibid. See also Andrew L.P, 'Injustice ex Machina: Predictive Algorithms in Criminal Sentencing' (2019) UCLA Law Review https://www.uclalawreview.org/injustice-ex-machina-predictive-algorithms-in-criminal-sentencing/

50 Ibid.

51 Ibid.

possible to quickly analyse a vast database of legal information and extract relevant statutes, case precedents, and legal opinions within seconds instead of spending countless hours poring over law books and case files.[52] These AI-powered tools streamline the cumbersome process of document review by sifting through large volumes of documents, identifying relevant information, and organising case files in a very short time, reducing the risk of overlooking crucial evidence.[53] Some of the most popular AI software assisting lawyers in this area include Definely, Gavel and Clio which are top legaltech companies operating across countries such as Canada, the United States of America and the United Kingdom. In Nigeia, Law Pavillion recently launched its first artificial intelligent lawyer bot, named Timi, which helps lawyers to quickly review procedural rules but does not capture criminal matters.[54] If there is one thing that the automation of routine tasks provides, it is allowing criminal defence lawyers to focus on more complex and high-value work in order to enhance productivity and efficiency in criminal law practise.

The ability to analyse vast amounts of data to identify patterns and trends also helps criminal defence lawyers and prosecution develop stronger case strategies, anticipate potential arguments from the opposing party, and better grasp the tendencies of judges, thereby shaping their arguments accordingly. AI predictive analytics enable lawyers to make more informed predictions about the potential outcome of a case by comparing past judgements with variables in current cases.[55] AI algorithms used to analyse factors such as the severity of the crime, the defendant's criminal history, and demographic information can assist lawyers in providing more accurate and fair sentencing recommendations to judges, who are

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52 Faggella D, 'AI in Law and Legal Practice – A Comprehensive View of 35 Current Applications' (2021) Emerj Artificial Intelligence Research https://emerj.com/ai-sector-overviews/ai-in-law-legal-practice-current-applications/

53 Ibid.

54 Ifeoma P, 'LawPavilion Unveils 'TIMI'; Nigeria's First Artificial Intelligence Legal Assistant' (2018) DNL Legal and Style https://dnllegalandstyle.com/2018/lawpavilion-unveils-timi-nigerias-first-artificial-intelligence-legal-assistant/ accessed 1 August 2023

55 Ibid.

then rightly positioned to select from data-driven sentencing options.[56]

E. Other applications of AI

There are other facets of the legal profession have been altered by Artificial intelligence (AI) including the use of chatbots (including generative AI like ChatGPT) used as virtual legal assistants provide advice and information on the law to people in need of legal representation.[57] Using chatbots or helplines, AI-Based Crisis Support can offer resources and quick aid to victims of crime. Also, AI analytics may be deployed to support data-driven policymaking by evaluating the efficacy of criminal justice policies, programmes and recommending evidence-based improvements.[58] At the level of governance, the use of AI also improves budget planning and resource allocation for criminal justice projects, thereby increasing the effectiveness of the legal system as a whole.[59]

4. Opportunities for AI Implementation in Nigeria

The criminal justice system in Nigeria faces numerous challenges that hinder its effectiveness. The Nigerian Police Force encounters difficulties such as inadequate resources, inadequate tools, bad reputation, a lack of respect, corruption, an insufficient number of police personnel, operational issues, and political issues.[60] Additionally, impersonation of police officers and excessive use of force contribute to the Nigerian law enforcement problem. The courts grapple with slow delivery of justice and inadequate funding, while correctional services also face issues such as overcrowding and other logistical problems.[61] All these factors combine to create

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56 Welty J, 'Artificial Intelligence and the Practice of Criminal Law – North Carolina Criminal Law' (2023) North Carolina Criminal Law https://nccriminallaw.sog.unc.edu/artificial-intelligence-and-the-practice-of-criminal-law/ accessed 31 July 2023.

57 Andrew P, 'The Implications of CHATGPT for Legal Services and Society' (2023) Harvard Law School Center on the Legal Profession https://clp.law.harvard.edu/knowledge-hub/magazine/issues/generative-ai-in-the-legal-profession/the-implications-of-chatgpt-for-legal-services-and-society/ accessed 2 August 2023.

58 Ibid.

59 Asma Idder & Stephane Coulax (n 4).

60 Nwafor NE, Aduma OC, 'Problems of the Administration of Criminal Justice System in Nigeria and the Applicability of Alternative Dispute Resolution' (2020) 7(2) Journal of Commercial and Property Law

61 Ibid.

obstacles for Nigeria's criminal justice system to function efficiently. Implementing AI in Nigeria's criminal justice system has the potential to bring about significant positive changes, improving access to justice, reducing inefficiencies, and enhancing overall security and fairness in the legal process. Some of the opportunities are considered below.

a. ***Improved Efficiency and Time-saving****:* As earlier discussed, the ability of AI to automate time-consuming tasks such as data analysis, document processing, and case management can result in faster and more efficient criminal justice processes in Nigeria when it is rightly deployed by courts, lawyers, and other criminal justice stakeholders[62]. Due to the nature of the process of criminal justice in Nigeria, stakeholders like lawyers and judges regularly interact with pertinent data from lots of paperwork. Recently, the Supreme Court of Nigeria, through its "legal mail" initiative, allowed registered lawyers to electronically serve court processes and legal documents instead of the traditional manual method.[63] This can be augmented to cover other manual procedures currently in place to address the problems of frivolous adjournments that pervade criminal cases in Nigeria. Furthermore, issues like legal document evaluation or review are still largely handled manually by lawyers and judges, and this, unfortunately, consumes time and is subject to human mistakes. Additionally, it wastes the time and effort required for important legal activities. In any case, AI-powered software can help Nigerian criminal justice stakeholders with document review, which is less susceptible to error. ROSS Intelligence, for instance, is an AI system that automates the evaluation of legal documents. The legal research platform offers cognitive computing that analyses legal documents using natural language processing.[64] This kind of technology can be deployed to assist lawyers and judges in processing and reviewing legal documents.

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62 Edlich A, Phalin G, Jogani R, Kaniyar S, 'Driving Impact at Scale from Automation and AI' (2019) McKinsey Global Institute 100

63 Olugasa O, Davies A, 'Remote Court Proceedings in Nigeria: Justice Online or Justice on the Line' (2022) 13(2) International Journal for Court Administration https://doi.org/10.36745/ijca.448

64 Farrands D, 'Artificial Intelligence and Litigation – Future Possibilities' (2020) 9(1) Journal of Civil Litigation and Practice 7-33.

b. ***Enhanced Data Analysis and Decision-making:*** AI algorithms can analyse vast amounts of data from various sources, enabling better-informed and data-driven decisions for law enforcement, prosecutors, and judges in Nigeria. Predictive justice is one example, which is the statistical study of a significant body of case law data, mostly previously given court decisions, in order to forecast the results of legal proceedings. AI's ability to recognise patterns in text documents and identify possible judgement directions can help predict recidivism in criminal cases, aiding judges in bail terms, pre-trial detention, sentencing, and parole decisions in line with the Administration of Criminal Justice Act 2015. In the long-term, it can increase the consistency of court rulings for better outcomes.[65]

c. ***Predictive Analytics:*** One critical problem in Nigerian courts is the issue of a backlog of cases, and this is sometimes due to prosecutors' inability to predict outcomes accurately or identify the most appropriate evidence, thereby posing a significant challenge to determining whether to prosecute or not. At the Federal High Court alone as of June 2021, there were over 30,197 criminal cases, 35,563 motions, and 20,258 applications for the enforcement of basic rights, among others.[66] Nonetheless, the integration of AI into the legal field offers a remedy for this problem, as AI's ability to analyse data allows it to forecast legal case resolutions more reliably than human litigators. Researchers at University College, London, and the University of Pennsylvania made the decision to test the aforementioned by using AI software algorithms on the 584 cases from the European Court of Human Rights. Surprisingly, the computers discovered a reoccurring pattern in these instances, and this resulted in 79% accuracy in predicting outcomes.[67] Nigerian litigators will be better prepared to accurately forecast the outcome

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65 Asma Idder & Stephane Coulax (n 4).

66 Sobowale R, '30,197 Criminal Cases Filed in Federal High Court in 10 Months, Says Chief Judge' (December 17, 2021) Vanguard News <https://www.vanguardngr.com/2021/12/30197-criminal-cases-filed-in-federal-high-court-in-10-months-says-chief-judge> accessed August 5, 2023.

67 Aletras N, Tsarapatsanis D, Preoţiuc-Pietro D, Lampos V, 'Predicting Judicial Decisions of the European Court of Human Rights: A Natural Language Processing Perspective' (2016) 2 PeerJ e93 https://doi.org/10.7717/peerj-cs.93.

of cases when AI software is deployed for swift analysis of case precedents.[68]

d. ***Investigative Support:*** Further, AI-powered crime prediction models can help law enforcement agencies in Nigeria identify potential crime hotspots and patterns, enabling proactive crime prevention strategies. AI tools can aid investigators in analysing digital evidence, identifying patterns, and connecting disparate pieces of information to solve complex cases. AI can streamline forensic analysis processes such as fingerprint and DNA matching, leading to more accurate and efficient investigations. AI can help investigators analyse case data and evidence early in the legal process, facilitating faster resolution and reducing the caseload backlog. This will greatly improve the efficiency of prosecutors and law enforcement agencies like the Nigerian Police Force.

e. ***Virtual Legal Assistants:*** AI-powered chatbots and virtual assistants can provide legal information, answer common questions, and offer support to millions of Nigerians seeking legal advice or help. For instance, according to the HiiL's 2023 findings, the second most prevalent legal problem category in Nigeria is domestic violence.[69] The research further states that 'beyond Nigerians' social network, the most frequent sources of help include the police (11%), community/traditional leaders (8%), religious authorities (6%), landlords (6%), local public authorities (5%), and lawyers (5%)'. In the majority of these cases, people are often unsure of the appropriate action to take to redress their grievances. Nigerian criminal justice stakeholders can also deploy AI to address these issues at the most basic level, as is currently being proposed in other countries. For instance, in Thailand, Police Lieutenant Colonel Peabrom Mekhiyanont was aware of the difficulties survivors of gender-based violence encounter in getting justice because of a lack of knowledge. To combat this, she used artificial intelligence (AI) to create the Sis

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[68] Marr Bernard, 'How AI and Machine Learning Are Transforming Law Firms and The Legal Sector' (2018 Forbes) <https://bernardmarr.com/default.asp?contentID=1464> accessed August 5, 2023.

[69] The Hague Institute for Innovation of Law (HiiL), 'Justice Needs and Satisfaction in Nigeria' (2023) HiiL https://www.hiil.org/research/justice-needs-and-satisfaction-in-nigeria/

Bot, a chatbot that offers survivors information and assistance around the clock through services like Facebook Messenger. From police reporting and evidence preservation to legal entitlements and support services, Sis. Bot provides thorough information to support the victims. A similar AI-powered application could be deployed in Nigeria to improve access to justice and lessen the stigma associated with gender-based violence by empowering survivors to make knowledgeable decisions and bridging the information gap.

f. ***Risk Assessment for Smart Sentencing and Parole Decisions:*** AI algorithms can assist judges in making fair and data-driven sentencing and parole decisions based on factors like past records and risk assessment. This will largely reduce the number of inmates in the currently overcrowded correctional facilities in Nigeria. As of July 2023, Nigeria had 79,076 inmates (in facilities originally built for 50,153 inmates),[70]which makes it the 27th country in the world with the highest number of prisoners, with over 68.5% of its prisoners being pre-trial detainees.[71] Several initiatives have been suggested to address this issue, especially as the abolition of holding charges by the Administration of Criminal Justice Act 2015 has not exactly achieved the level of reduction expected, even though it has brought about remarkable development. Along this line, risk assessment through AI is an innovation that could improve the Nigerian prison system.[72] For courts and corrections, by classifying people according to how likely they are to commit crimes, risk assessment systems help lower imprisonment rates and forecast recidivism. A risk assessment method is used to forecast recidivism, or the possibility that someone would resume a life of crime after being released from prison, and to lower the rate of incarceration. The various risks assessement AI systems in existence have several variations that carry out somewhat different functions. Some determine whether a person should be released on bail or not (PSA),

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70 Ibid.

71 Fatunmole M, 'Nigeria Ranks 27th Among Countries with Highest Number of Prisoners' (2023) The ICIR- Latest News, Politics, Governance, Elections, Investigation, Factcheck, Covid-19 https://www.icirnigeria.org/nigeria-ranks-27th-among-countries-with-the-highest-number-of-prisoners/

72 Akin Agunbiade, (n 48).

while others determine the likelihood that a person will commit a crime (COMPAS).[73] While another version (IDSS) aids judges in making choices on sentences in traffic matters, a third version (LSI-R and ORAS) suggests sentencing possibilities.[74] These programmes used in the USA and Israel use statistical data to estimate the likelihood of criminal activity and guide choices about bail, punishment, and release.[75] Due to previous discrepancies in police data, biases might nonetheless manifest in their suggestions, thereby impacting outcomes for marginalised populations. As an illustration, some of them have been charged with prejudice against black individuals in the USA for calling for their incarceration while calling for milder punishments for white people who commit the same act.[76]

For law enforcement agencies, research from the Centre for Economic Performance at LSE found that machine-learning approaches are more accurate than traditional risk assessments at predicting the likelihood of repeat domestic violence events.[77] Machine-learning algorithms are capable of making more precise predictions about the risk of repeat occurrences than conventional police force surveys by looking at data including criminal histories, police calls, and recorded violent activities.[78] Researchers looked at more than 165,000 complaints of domestic violence made to Greater Manchester Police and discovered that machine learning might lower the negative prediction rate from 11.5% to as low as 6.1%, potentially enhancing the police response to domestic abuse incidents.[79] These AI systems can also be deployed in Nigeria to empower the Nigerian Police Force and other law enforcement

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73 Mattu J, Larson L, Kirchner K, 'How We Analyzed the COMPAS Recidivism Algorithm' (2020) ProPublica https://www.propublica.org/article/how-we-analyzed-the-compas-recidivism-algorithm

74 Akin Agunbiade, (n 48).

75 Ibid.

76 Ibid.

77 Ivandic R, 'Artificial Intelligence Could Help Protect Victims of Domestic Violence' (2020) London School of Economics and Political Science https://www.lse.ac.uk/News/Latest-news-from-LSE/2020/b-Feb-20/Artificial-intelligence-could-help-protect-victims-of-domestic-violence accessed 31 July 2023

78 Ibid.

79 Barlow N, 'Study of Greater Manchester Police Calls About Domestic Abuse Suggest Artificial Intelligence Could Help Protect Victims of Domestic Violence' (2020) About Manchester https://aboutmanchester.co.uk/study-of-greater-manchester-police-calls-about-domestic-abuse-suggest-artificial-intelligence-could-help-protect-victims-of-domestic-violence/

agencies in understand the trends of criminal activities, mapping the high-risk crime-prone regions and preparing to respond effectively to criminal reports.

5. Challenges and Concerns

This section examines some of the challenges posed by AI-driven criminal justice systems.

a. ***Bias and Fairness****:* AI algorithms may inherit biases present in the training data, leading to potential discrimination against certain demographic groups and causing unfair outcomes in sentencing and other decisions.[80] The majority of AI systems utilised by criminal justice systems are statistical models that are based on data that reflects the underlying biases and disparities in the societies that the data represents and that makes the whole arrangement consistently deficient in the kind of detail required to make truly "accurate" predictions or decisions.[81] Most or all of the information needed to create and fill these systems comes from the criminal justice system, such as information from law enforcement or crime statistics. The data reflects societal inequality and biassed police behaviours, and its usage in these AI systems only serves to reinforce and deepen such disparities and prejudice in the outcomes of criminal justice. For instance, considering that the female prisoner percentage in Nigeria is a meagre 2.4%, a risk assessment system may award women a better score for bail even if a woman committed an offence with a higher level of seriousness than a male. This is why Agunbiade proposed a Nigerian Risk Assessment System (NIRAS), which he recommended be publicly developed, focusing on minor offences initially and with data minimization to prevent biases.[82] However, one issue with this proposal may be that where the AI algorithm is not built with sufficient data, it may further amplify the challenge of unreliability in its results. This is why it is important to carefully consider the specific goals of every AI application and the delicate balance between data minimization and data sufficiency.

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80 Heaven WD, 'Predictive Policing Algorithms Are Racist. They Need to Be Dismantled' (2023) MIT Technology Review https://www.technologyreview.com/2020/07/17/1005396/predictive-policing-algorithms-racist-dismantled-machine-learning-bias-criminal-justice/

81 Asma Idder & Stephane Coulax (n 4).

82 Akin Agunbiade, (n 48).

b. ***Lack of Legal Framework:*** The rapid advancement of AI technology has outpaced the development of comprehensive legal frameworks to regulate its use in the criminal justice system, creating uncertainty and challenges in its implementation across the world. The use of AI in law enforcement necessitates a high degree of accountability, justice, and openness in order to prevent discrimination and the violation of basic rights. Some countries are responding proactively to this development. The Artificial Intelligence Act was proposed by the European Commission on April 21, 2021, in order to codify the high standards of the EU's trustworthy AI paradigm and to ensure that AI is "legally, ethically, and technically robust while respecting democratic values, human rights, and the rule of law."[83] Essentially, the EU AI Act establishes a "product safety framework" based on four risk levels (minimum, limited, high, and unacceptable). Recently, the European Parliament voiced opposition to widespread surveillance and demanded that private face recognition AI databases like Clearview be outlawed considering the level of risk they pose. Meanwhile, Nigeria presently lacks a thorough regulatory or policy framework for AI.[84] To encourage the use of AI and handle any concerns related to the technology, certain measures have been taken in this regard in furtherance to the current policy efforts of the National Information Technology Development Agency.[85]

c. ***Cost and Resource Constraints:*** Adopting AI technology requires significant financial investments and skilled personnel, which might pose challenges for resource-constrained jurisdictions. For instance, companies using AI services offered by a third party on a unique platform created by a group of internal or external data scientists can spend anywhere from $4,000 to $300,000 in setting up

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83 Kop M, 'EU Artificial Intelligence Act: The European Approach to AI' (2021) Stanford - Vienna Transatlantic Technology Law Forum, Transatlantic Antitrust and IPR Developments, Stanford University, Issue No. 2/2021 https://law.stanford.edu/publications/euartificial-intelligence-act-the-european-approach-to-ai/

84 Asma Idder & Stephane Coulax (n 4).

85 Uba J, 'Artificial Intelligence (AI) And AI Attacks In Nigeria: A Call To Action For Nigerian Policymakers' (2023) New Technology - Nigeria https://www.mondaq.com/nigeria/new-technology/1309534/artificial-intelligence-ai-and-ai-attacks-in-nigeria-a-call-to-action-for-nigerian-policymaker accessed 8 August 2023.

and running the systems.[86] This may be a little challenging, especially in Nigeria, where the infrastructural condition of the judiciary is very poor. Judges and magistrates have to deal with subpar infrastructure, including leaky roofs and crowded courtrooms, which highlights the appalling condition of court facilities throughout Nigeria. The grave circumstance is highlighted by the delapidated court complex that collapsed on the chief judge of the state of Ekiti in July 2023.[87]

d. ***Lack of Technical Know-how and Overreliance on Technology****:* Over-reliance on AI systems without adequate human oversight can lead to the neglect of contextual factors and individual circumstances crucial for just and fair decision-making. When it comes to working with an AI system, there is a theoretical belief that the choices made by a person in collaboration with the AI system would be better than those made by either party individually. It has been observed that people often rely too heavily on the advice of AI systems, even when it is incorrect. This phenomenon is referred to as AI overreliance.[88] As a result, important real-world decisions such as setting bail or making medical diagnoses may be prone to errors when individuals place too much trust in AI systems.[89] The consequences of over-relying on AI-generated content has been made obvious in recent legal cases. Just recently, Judge Castel imposed a hefty fine of $5000 on two attorneys from New York. These lawyers were found guilty of presenting fabricated cases that were generated using ChatGPT, an AI chatbot.[90] It is interesting to note that this issue is not limited to one jurisdiction alone. The Johannesburg Regional Court also encountered and frowned at a

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86 Palokangas E, 'How Much Does AI Cost? What to Consider' (2023) Scribe https://scribehow.com/library/cost-of-ai

87 Bankole I, 'Slow Justice: How Infrastructure Decay Hampers Judicial System' (August 2023) Vanguard News https://www.vanguardngr.com/2023/08/slow-justice-how-infrastructure-decay-hampers-judicial-system/

88 Passi S, Vorvoreanu M, 'Aether Overreliance on AI Review' (2022) Microsoft https://www.microsoft.com/en-us/research/uploads/prod/2022/06/Aether-Overreliance-on-AI-Review-Final-6.21.22.pdf

89 Ibid.

90 Bohannon M, 'Judge Fines Two Lawyers For Using Fake Cases From ChatGPT' (22 June 2023) Forbes https://www.forbes.com/sites/mollybohannon/2023/06/22/judge-fines-two-lawyers-for-using-fake-cases-from-chatgpt/ accessed 6, August, 2023.

similar situation where South African lawyers relied on phoney cases, that never existed but created by ChatGPT to support their arguments.[91] This highlights the dangers of over-relying on AI tools and importance of training legal professionals how to appropriately use AI tools for their legal works.

e. ***Public Perception and Acceptance:*** Concerns about AI's potential impact on civil liberties and privacy can lead to public scepticism and resistance to its implementation in criminal justice practises. When it comes to incorporating AI into the field of criminal justice, it is crucial to have a comprehensive understanding of the technology and its various applications. In Nigeria, numerous parties, such as law enforcement agencies and policymakers, may not possess a complete awareness of the capabilities and advantages that AI can offer in this particular domain.[92] This may negatively influence perceptions of AI applications. Also, the use of AI algorithms in the criminal justice system has raised concerns due to the lack of transparency and understanding surrounding their decision-making process. These algorithms often operate as "black boxes," making it difficult to comprehend how they arrive at their conclusions.[93] This lack of transparency undermines trust and accountability in the system.

6. Future Prospects and Recommendations

a. Create an Enabling environment for Innovation and collaboration.

It is important to facilitate partnerships between the government, academia, the private sector, and civil society to co-create AI solutions for criminal justice by fostering an environment where expertise is shared and solutions are developed collaboratively. Impressively, some legal tech companies are already

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91 Fakiya V, 'South African Court Calls Out Lawyers for Using ChatGPT References' (2023) Techpoint Africa https://techpoint.africa/2023/07/10/techpoint-digest-622/

92 Elijah O, 'Artificial Intelligence Will Force Lawyers to Be Tech-Literate' (2023) Businessday NG https://businessday.ng/news/legal-business/article/artificial-intelligence-will-force-lawyers-to-be-tech-literate accessed 13 April 2023

93 Jagati S, 'AI's Black Box Problem: Challenges and Solutions for a Transparent Future' (May 32023) Cointelegraph https://cointelegraph.com/news/ai-s-black-box-problem-challenges-and-solutions-for-a-transparent-future accessed 5 August 2023

making use of artificial intelligence to create services that will make stakeholders more efficient, but adoption is still low. For instance, LawPavilion has been working on its Smart Justice Delivery to help judges speed up the review of written arguments, alert the judge to earlier decisions that are similar, and provide information on how likely ways appeals may turn out.[94] However, stakeholders will need to test these technologies to examine the possiblity of integrate them into their workflow. Also, justice innovators should be able to access funding, grants, and incentives for research and development in AI technologies for criminal justice. By making capital available in line with Section 27 of the Nigerian Startup Act, startups and local innovators will be encouraged to develop interest in legaltech and justice-tech, just as in the booming Nigerian fintech space, and to solve specific challenges within the legal system.

b. ***Policy Recommendations for Responsible AI Implementation***

It is recommended that the government should develop a comprehensive national AI policy that outlines the strategic goals, principles, and guidelines for AI integration in the criminal justice system. This policy should address transparency, accountability, ethical considerations, data privacy, and bias mitigation.[95] Undoubtedly, at the public service level, it is important that the journey towards digitization be hastened, as traditional paper work is known for slowing down the justice delivery process. Building a robust AI system for criminal justice may be an arduous task in a country where most of its criminal records are paper-based, and this means there is a need for digitization before the needed data collection and processing for training and building algorithms can be made possible.[96] Luckily, there is already activity in this regard, as some government agencies are being transformed by large-scale

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94 Olusoga O, 'Nigerian Judges Now Set to Use A.I (Artificial Intelligence) in Justice Delivery, With LawPavilion' (2021) LawPavilion Blog, LawPavilion https://lawpavilion.com/blog/nigerian-judges-now-set-to-use-a-i-artificial-intelligence-in-justice-delivery-with-lawpavilion/

95 https://www.mondaq.com/nigeria/new-technology/1309534/artificial-intelligence-ai-and-ai-attacks-in-nigeria-a-call-to-action-for-nigerian-policymakers#:~:text=Nigeria%20currently%20does%20not%20have,risks%20associated%20with%20the%20technology.

96 Akin Agunbiade, (n 48).

digitization.[97] However, as noted by Akingbade,[98] as these agencies digitise their workflow, any attempt towards AI systems such as risk assessment should flow from a partnership between all relevant stakeholders, including the Nigeria Police Force, the correctional service, and the judiciary.

c. Capacity Building

There is a need for stakeholders to engage in training programmes to equip legal professionals, judges, and law enforcement officers with the knowledge and skills to understand, evaluate, and work collaboratively with AI technologies. Building capacity is important since it will enable stakeholders to develop and manage AI systems without falling victim to overreliance or misuse. For instance, when it comes to utilising generative AI (such as ChatGPT) in legal tasks, it is crucial for lawyers to prioritise human review and verification of ChatGPT's drafted documents.[99] This ensures accuracy and compliance, avoiding any potential issues like citing non-existing cases as earlier discussed. This will also improve public acceptance and perception of AI. Lawyers should view ChatGPT as a supplementary tool for efficiency ather than a substitute for their expertise. Hence, a basic knowledge for criminal justice stakeholder would be to do a critical review of content gotten from generative AI.

d. Balancing Technological Advancements with Human Rights and Fairness

AI systems must be developed to ensure that they do not produce unfair results or threaten human's rights. In order to detect and remedy any discriminatory effects, AI systems should be put through the required testing both before and after deployment.[100] The criminal justice system should not use AI systems that are unable to

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97 Oladoun L, 'Nigerian Government Spends N152bn on Digitalisation in 2021' (January 14 2022) Businessday NG https://businessday.ng/news/article/nigerian-government-spends-n152bn-on-digitalisation-in-2021/ accessed 8 August 2023

98 Akin Agunbiade, (n 48).

99 Santiago P, 'Responsible Use of Chat GPT by Lawyers' (2023) Dentons https://www.dentons.com/en/insights/articles/2023/june/8/responsible-use-of-chat-gpt-by-lawyers

100 Asma Idder & Stephane Coulax (n 4).

satisfy the baseline requirements of protecting individual rights and freedoms.[101] For instance, defendants and suspects must not be adversely affected, either directly or indirectly, because of their protected characteristics, such as race, ethnicity, nationality, or socioeconomic background.

7. Conclusion

New applications of AI in criminal justice are constantly being developed across the world, opening up new opportunities to improve the criminal justice system. For Nigeria, it is remarkable that several developments have been initiated in the criminal justice space since the enactment of the ACJA 2015. However, the present challenges that bedevil the criminal justice sector reveal that there is still a lot of transfromation to take place. This article has examined some of the multifaceted roles of AI in transforming criminal justice processes for various stakeholders. It is argued that AI offers numerous promising prospects for improving justice sector outcomes, but the technical and ethical concerns associated with AI should not be ignored in order to build public trust and confidence in its integration. Conclusively, it is believed that if the recommendations are implemented, they will position Nigeria to appropriately leverage AI for a more efficient criminal justice system.

[101] Jones K, 'AI Governance and Human Rights' (2023) Chatham House https://www.chathamhouse.org/sites/default/files/2023-01/2023-01-10-AI-governance-human-rights-jones.pdf