Artificial Intelligence for sustainable and effective justice delivery in India

Parth Jain
Department of Laws, Panjab University, Chandigarh, India
Corresponding authour: adv.parth.jain@gmail.com, parthjainjudge@gmail.com

Abstract: The constant increase in the number of pending cases in Indian courts has been a cause of concern for the legislative, executive and the judicial wings of the country and to overcome this problem, various steps are being taken like pressing for Alternative Dispute Resolution (or ADR) mechanisms and scrapping of redundant laws but applying the new found field of Artificial Intelligence to cope up with this conundrum is an area that is still unexplored. India, being the largest democracy in the world with a population of more than 125 crores (1.25 billion), faces the problem of shortage of resources in almost every sector and Indian judiciary is no different. With the problem of shortage of judges and ever increasing rate of institution of cases, the net result is that a civil or a criminal trial takes years to get decided as compared to time taken by developed countries where trial is a matter of a few days. The net result, then, is delayed and ineffective justice delivery which is not very useful for any society. It is, therefore, necessary to think of out of the box solutions, in addition to the conventional ones, to restore the effectiveness and efficiency of the justice delivery system and make the same sustainable. One such solution is putting Artificial Intelligence to use in disposing judicial matters. Since courts in India are already undergoing a transformational change by going digital, the emerging domain of science called 'Artificial Intelligence' or 'AI' may help in surprising ways to ensure sustainable justice delivery and reduce the backlog of pending cases. Judiciary in some parts of developed countries like U.S.A and Canada has already deployed AI systems to assist the judges on taking a call on matters like granting of bail and release of offenders on parole. Likewise, in India too, court tasks can be identified which can be expedited through the use of intelligent machines. These tasks may range from routine matters such as service of processes to complex ones like evaluation of evidence. This will not only save judicial time of the courts leading to better utilization of public money but may also help in reducing the impact personal biases of the judge in decision making. Of course, trained machines, howsoever intelligent, cannot replace human judges. Nevertheless, these may help the judges in the decision-making process by giving calculated and unbiased opinions and thus ensuring that in the process of handling large number of cases, justice does not become a casualty. In this doctrinal research, the researcher has referred to both primary and secondary sources of data. As Artificial Intelligence has already proved its worth in different fields such as medicine by assisting doctors in conducting surgeries, transportation in the shape of self-driving cars, marketing by tracking consumer buying patterns, etc., it will definitely be a blessing to ensure sustainable and speedy justice delivery system. Therefore, use of Artificial Intelligence in decision making in courts is a viable solution for bringing down the pendency of cases not only in India but also in other jurisdictions and ensuring speedy and sustainable justice delivery systems across the world.

Keywords: AI, Artificial Intelligence, Courts, Justice, Sustainability

Introduction: The Problem of Pendency

India is the largest democracy in the world with its population likely to cross that of China by 2028 as per reports. [1] As per United Nations estimate, the figure of Indian population has already reached 1,354,334,793 [2] and past trends show that its population has been increasing constantly.
The following table clearly shows the trends of growth in Indian population [3]:

Year	Population	Yearly Percentage Change
2018	1,354,051,854	1.11%
2017	1,339,180,127	1.13%
2016	1,324,171,354	1.15%
2015	1,309,053,980	1.24%
2010	1,230,980,691	1.47%

This constant increase in population coupled with improved financial conditions, lack of tolerance and materialistic way of life has resulted in the increase in the number of civil and criminal litigation and concomitantly, the pendency of cases in the courts of law has also increased. [4] The current pendency is 27,571,757 cases [5] and this huge number is, along with several other factors, the root cause of the problem of delayed, and thus, ineffective justice delivery in India. A Civil or Criminal case usually takes years to get decided as compared to a few days in developed countries like USA or Canada. If these numbers continue to increase, there may come a point of time that the judicial set up of the country crumbles down under the weight of its own dockets rendering the noble cause of justice delivery come to a standstill. If this happens, not only the fundamental philosophy of any civilized society based upon rule of law would be affected but also a state of anarchy is bound to follow and therefore, it becomes necessary to ensure that the institution of judiciary built to shoulder the responsibility of maintaining rule of law is not paralyzed .

Solutions: The journey so far

To control the problem of decongestion in the courts, the judiciary, as well as the legislature of India, has taken steps in their own sphere. For instance, the judiciary has been vigorously promoting Alternate Dispute Resolution mechanisms such as Mediation and Arbitration, LokAdalats [6] (or People's Court), Fast Track Courts [7], NyayaPanchayats and Gram Nyayalayas [8] (or Village Courts). Court Management Systems have also been introduced with the help of which the presiding officer of a court can effectively monitor the progress of the case right from the time it is filed till it has been decided and take steps for expediting a case whenever a need is felt. [9] In addition to this, the judicial officers are given quarterly and annual targets and action plans to achieve those targets. [10] The legislature also has scrapped 1200 redundant laws in a move to reduce the pendency of cases in courts and is also considering opening of new courts. [11] These steps have helped to some extent in unclogging the dockets but despite the best efforts, a complete win over the malady of pendency is yet to be witnessed. It is in this backdrop that it is proposed that some out of the box solution be considered to handle this quandary.
One such solution is use of technology in legal sphere to hasten different processes at various stages. For example, courts in India have now started to record evidence of witnesses and mark the presence of under trial prisoners through video-conferencing. [12] This not only saves time and public money but is also convenient to the person who has to travel long distances to depose in the court. Digitization of court records and daily updating of court orders on the court's website is another way in which technology is being used by the courts. This saves the litigant from the botheration of obtaining a copy of the court order in order to know the progress of his case and he can keep himself abreast of the latest development of his case at the click of the mouse. [13] Taking the use of technology one step further, it is proposed that the new found field of Artificial Intelligence (or AI) be used to assist judges and lawyers in the cause of dispensing quick justice.

Untapped Solution: Artificial Intelligence

Artificial Intelligence(hereinafter also referred to as AI) is the new buzzword not only in the field of science but almost in every discipline that it has touched. In the era of automated machines, the temptation to rely more and more on these machines even for the smallest of the tasks is a natural fallout. As a result, the idea of 'Artificial Intelligence' or 'Machine Intelligence' came into being. To explain the meaning of Artificial Intelligence, following definitions can be considered:

- Artificial intelligence is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience. [14]
- An area of computer science that deals with giving machines the ability to seem like they have human intelligence. [15]
- Artificial intelligence is a type of computer technology which is concerned with making machines carry out work in an intelligent way, similar to the way a human would. [16]

In nutshell, Artificial Intelligence is the ability of a machine to think and act like humans or replicate "cognitive" functions that humans associate with other human minds, such as "learning" and "problem solving". [17]

An AI powered machine can usually perceive its environment, identify the problem that it is designed to solve, chalk out the various options for doing so, calculate the cost and benefit of each option along with the probability of success of each of such option and execute the task of solving the problem with the best possible precision. Not only this, an AI powered machine is also capable unassisted learning which means that the machine can improve its working through experience on its own, something similar to on the job training for humans. These distinctive features of an AI powered machine have made it possible to employ them in myriad fields like Healthcare, Automotive, Defence, Marketing, Education, etc. In Healthcare, AI is helping in medical diagnosis, managing health records, designing treatments, managing medication and drug creation. [18] It is also assisting doctors in conducting surgeries with precision. [19] Driverless cars are the most glaring example of AI in automotive industry. In the field of warfare, Artificial Intelligence is being used for battlefield analysis and tactical decisions and also for production of intelligent and autonomous unmanned weapon systems. [20] With the introduction of chatbots to handle customer queries, image and voice recognition techniques for faster search results and recommendation engines that use customer's information to suggest products to them suited to their needs, Artificial Intelligence is making a mark for itself in the field of marketing as well. [21] Education is another dimension where AI has been creating ripples. Using machines to check and evaluate answers to multiple choice questions is now a commonplace thing as software developers are taking a further leap and are developing software that can assess the subjective content written by a student. [22] Pearson has already suggested that in future, students will have a lifelong AI companion that will keep track of their performance right from school till graduation, thus helping them to realize their strengths and work on their weaknesses. [23]

Having worked out wonderfully well in these fields, it is proposed that Artificial Intelligence can be used in courts to tackle the problem of burgeoning pendency by assisting judges expedite various legal processes. Even for law firms and lawyers, AI is already turning out to be boon in terms of saving time and money. For example, lawyers are now using AI powered speech recognition software such as Dragon [24] for swift drafting and note taking. Similarly, AI powered machines are helping lawyers review documents especially contracts with increased efficiency and that too in a fraction of time that is usually taken up by humans. [25] Contract Intelligence or COIN is the software that is being extensively used for this purpose. [26] Not only this, in a recent competition between lawyers and an AI powered machine to predict the results of cases, the AI powered computer was able to predict results with 86.6% accuracy as compared to 66.3% accuracy of that of lawyers. [27] This highlights that AI will also be used in future by lawyers in advising their clients best legal course of action. Legal Research is another area where the lawyers are relying upon AI machines. [28]

Some examples of use of Artificial Intelligence in Legal Field: [29]

➢ Wusong Technology in China is working on digitizing the way Courts function using AI-enabled robot-chatbot called "FaXiaotao" which offers users case analysis and helps them locate lawyers.

➢ A robot called Xiao Fa was put into operation at the lawsuit center at Beijing No 1 Intermediate People's Court which can answer questions verbally or take queries on its screen with a touchscreen or keyboard and also print documents out.

➢ The Singapore based Wong Partnership also embraced AI technology from London-based AI firm Luminance to support its corporate/M&A practice. The firm uses the technology for due diligence of M&A transaction documents and to highlight sections that required human review and intervention.

➢ The Singapore office of Law firm Linklaters has been working with a software company, Eigen Technologies, to develop Nakhoda, an Artificial Intelligence (AI) program that uses natural language

processing, in which computers can recognise and respond to human language to read text contracts and documents such as NDAs.

➢ South Korean law firm Yulchon develops technology that provides low-cost compliance tools, including apps, for clients. The firm is also encouraging its lawyers to create new solutions themselves.

➢ An Indian firm, Cyril AmarchandMangaldas are now leveraging the power of AI for contract analysis and review by partnering with Canadian AI assistant Kira Systems.

➢ Startups likeCaseMine and NearLaw are trying to reinvent legal research by using VisualSearch and the CaseRanking algorithm to show the most relevant cases quickly. The algorithm sorts and ranks over 300,000 case records across 20+ Courts/ Tribunals to come out with the top 50 cases. The unique approach elegantly identifies the key 0.01% of cases that are relevant to the user.

Artificial Intelligence and Court of Law

Like lawyers, judges too can rely on AI powered machines for quickening various stages of a case which would ultimately mean overall lesser time for deciding the case. The stages in a civil and a criminal case are somewhat different and therefore necessary to discuss before understanding how AI can be used in these stages to hasten up different process.
A typical civil case would go through the following stages. [30]

Institution Phase	Trial Phase	Judgment Phase
Institution of suit	Framing of Issues	Judgment/Decree
Issue and service of summons	Plaintiff Evidence	Review of Decree
Appearance of defendant	Defendant Evidence	Appeal
Written statement by defendant	Final Arguments	Execution of Decree

A criminal case is generally initiated by lodging a First Information Report (F.I.R.) or as a complaint case has following stages. [31]

Police Case	Complaint Case
First Information Report (F.I.R.)	Complaint to the Judicial Magistrate
Investigation	Inquiry
Charge sheet	Complainant's Preliminary Evidence
Framing of Charge	Framing of Charges
Prosecution Evidence	Complainant's Evidence
Statement of Accused	Statement of Accused
Defence Evidence	Defence Evidence
Final Arguments	Final Arguments
Judgment and Order	Judgment and Order
Jail or Probation	Jail or Probation
Appeal	Appeal

Now, there are many miscellaneous tasks which a court has to perform, including making several interim decisions, in these stages but there are a few fundamental tasks which can be done using AI powered machines to expedite the overall decision making process. These are:

1. Reading and analyzing the contents of a document: Companies like Microsoft have already developed software that that is capable of reading and comprehending a document just like a human being or even better and answering questions based upon the contents of the document. [32] A Microsoft Research Asia team has reached the human parity milestone using the Stanford Question Answering Dataset, better known as SQuAD,

or Stanford Question Answering Dataset, test. This means that the machine was found equally good in reading and comprehending data. In fact, the score of the machine on this test was 82.650 whereas its human counterpart trailed just behind it with 82.304 with the same set of questions and answers. Researchers at Alibaba are also not behind as they also developed an AI powered machine that was able to reach 82.440 mark. [33] With more investment by the companies in the field of Machine Reading Comprehension, not only these scores will improve but so will the ability of a machine to assist humans in reading and comprehending humungous amounts of data. This ability of a machine can be put to use in courts to read and analyze pleadings of parties to easily chalk out point of agreement and points where the parties are at issue. This tool can also used to read and analyze evidence of both the parties. This will be of special assistance to the court in cases where the amount of pleadings and evidence is huge as not only the time of the court will be saved but also enable the judge to review his own comprehension of the matter in order to be doubly sure about his decision.

2. Summarizing the contents of a document: Acourthas to sift through documents such as pleadings, oral and documentary evidence placed on court file,the precedents on the issue and the lawas matter of routine before arriving at a conclusion. Therefore, a lot of time of the courts is taken in reading the contents of the documents. The judge has to examine each and every document carefully even to form a prima facie opinion about a case for the purpose of passing interim orders. It is true that the judge would anyways have to consider the document in detail while arriving at a final decision on merits, but it would be of tremendous use if a machine could tell the summary or abstract of a document to the judge for the purpose taking interim decisions like temporary injunction orders in a civil litigation and prima-facie case in a criminal case while summoning the accused. Even otherwise, a machine that can effectively summarize the contents of a document would be of immense use to the court as more precedents can be read in the same amount of time and therefore, improving the quality of legal research as well. Currently, Summarizer is one of the AI software that is being used for summarizing contents of the documents. [34] More advanced software on similar lines can be developed especially suited to the needs of the courts for effective summarizing of the content.

3.   Case law and law code research: Like lawyers,judges also spend a lot of time on the research of the precedents or case laws. It is to some extent due to this reason that there are delays in quick decision making in courts. [35] Putting Artificial Intelligence to use for the purpose of legal research by lawyers and judges may help in reducing the time taken to decide a case. ROSS is one such online legal research assistant which helps the legal community to delve into numerous case laws in detail and find the most relevant and appropriate of the case laws. [36] With the use of Machine Learning (ML) to develop the Natural Language Processing (NLP) of a machine, it is possible to standardize, classify, summarize and store huge quantities of data, something typically done in legal research. [37]

4.   Using Visualization and Predictive Analytics for settlement: Law firms and lawyers are leveraging big data analytics to visualize case data and see which cases are cited in other cases and whether they result in a favorable or unfavorable verdict. Predictive Analytics can also be used by courts to present the probable resultto the litigating parties so as to compel them to enter into an out of court settlement. This will not only help the lawyers and law firms to maximize their clients' return of investment by foreseeing the chances of winning or losing a trial but will also save the precious time of the courts by encouraging parties to settle the matter amicably. [38]

5.   Administration: With increased responsibilities on the judiciary, the judges, apart from deciding judicial matters, are also engaged in handling administrative matters which include, but are not limited to, receiving and sending official communications, directing and controlling ministerial staff of the court, planning and organizing different categories of trials and sensitizing litigants about their legal rights. In these circumstances, an AI powered machine can be put to use for the purpose of doing repetitive things to enable the judge focus on core judicial activities.

6.   Assistance on Bail/Parole/Probation matters: In criminal cases, it is almost in every case that a court has to take decision like whether to release the accused on bail during his trial or to send him to jail, whether to grant the benefit of probation to the convict by not sending him to jail and instead releasing him on the promise of good conduct, and whether to release a prisoner on parole or not. These are crucial decisions as they have a bearing not only upon the right of liberty of a person but also on safety of the society and therefore require the extraordinary indulgence of the court. This naturally asks for a lot of time as the court has go through each and every aspect of the case and that of the person before releasing him. In this backdrop, it is suggested that Artificial Intelligence machines be brought to use like it is already being used in some states of the United

States to assist the judges in not only making a quick decision regarding these important rights but also in ensuring that personal biases and perceptions of the judges do not come in the way of deciding important rights of the accused. In fact, judges in the United States have already started using an AI program called Public Safety Assessment, or PSA, before deciding whether or not an accused should be released on bail. [39] This software calculates the risk of recidivism and flight, i.e., risk of defendant again committing a crime and risk of his escape from the clutches of law. The AI software calculates the risk score by taking into account several factors such as: [40]

- Whether the current offense is violent?
- Whether the person had a pending charge at the time of the current offense?
- Whether the person has a prior misdemeanor conviction?
- Whether the person has a prior felony conviction?
- Whether the person has prior convictions for violent crimes?
- The person's age at the time of arrest?
- How many times the person failed to appear at a pretrial hearing in the last two years?
- Whether the person failed to appear at a pretrial hearing more than two years ago?

Other factors which can assist judges in arriving at bail, parole and probation decisions can also be similarly incorporated into the algorithm for the purpose of assisting court in taking a swift call on these matters. Needless to say that the opinion of these algorithms cannot replace the decision of the judge and should only be of advisory nature on which the judge may decide otherwise provided reasons for doing so exist.

Conclusion: The Final Verdict

Having discussed the current use of Artificial Intelligence in different fields and also its potential use in the courts of law to assist judges and lawyers, it is safely concluded that Artificial Intelligence powered machines can help lawyers to shorten the time taken in various tasks at different stages of a trial as also the judges by assisting them in stages of decision making process and thereby can ultimately help in reducing the length of time ordinarily taken in a trial. Saving time would inevitably mean better efficiencies in disposing of cases which would ultimately contribute to the cause of bringing down pendency in the courts of law. When this is done, the noble cause of ensuring effective and sustainable justice to the masses shall be achieved.

Acknowledgement

References

[1] India country profile. Retrieved from https://www.bbc.com/news/world-south-asia-12557384
[2] India Population. Retrieved from https://www.worldometers.info/world-population/india-population
[3] Ibid.
[4] Law Commission of India (Report No. 230). Retrieved from http://lawcommissionofindia.nic.in/reports/report230.pdf
[5] NJDG. Retrieved from http://njdg.ecourts.gov.in/njdg_public/main.php
[6] Lokadalat. Retrieved from https://nalsa.gov.in/lok-adalat
[7] Fast Track Courts. Retrieved from http://doj.gov.in/other-programmes/fast-track-courts
[8] Gram Nyayalayas. Retrieved from http://doj.gov.in/other-programmes/gram-nyayalayas
[9] Supra note 4.
[10] Supra note 5.
[11] V. Nair, Harish. Goodbye, old laws: Modi government scraps 1,200 redundant Acts, 1,824 more identified for repeal. Retrieved from https://www.indiatoday.in/mail-today/story/narendra-modi-law-ministry-ravi-shankar-prasad-984025-2017-06-22
[12] Gupta, Shivi. Video Conferencing in India Courts. Retrieved from https://www.myadvo.in/blog/video-conferencing-in-india-courts/

[13] All high courts to complete digitisation of records by year-end. Retrieved from https://timesofindia.indiatimes.com/city/chennai/all-hcs-to-complete-digitisation-of-records-by-year-end/articleshow/61312761.cms

[14] Copeland, B.J., Artificial Intelligence. Retrieved from https://www.britannica.com/technology/artificial-intelligence.

[15] Artificial intelligence. Retrieved from https://www.merriam-webster.com/dictionary/artificial%20intelligence

[16] Artificial intelligence. Retrieved from https://www.collinsdictionary.com/dictionary/english/artificial-intelligence

[17] Russel, Stuart &Norwig, Peter (2009) Artificial Intelligence: A Modern Approach, New Jersey, Prentice Hall.

[18] 10 Common Applications Of Artificial Intelligence In Healthcare. Retrieved from http://novatiosolutions.com/10-common-applications-artificial-intelligence-healthcare/

[19] Britt, Phill. How AI-Assisted Surgery Is Improving Surgical Outcomes. Retrieved from https://www.roboticsbusinessreview.com/health-medical/ai-assisted-surgery-improves-patient-outcomes/

[20] Gupta, Deepak Kumar. Military Applications of Artificial Intelligence. Retrieved from http://www.indiandefencereview.com/military-applications-of-artificial-intelligence/

[21] Faggella, Daniel. How e-commerce giants are using AI and marketing (Part 1). Retrieved from https://martechtoday.com/ecommerce-giants-using-ai-marketing-part-1-207259

[22] Lynch, Matthew, 7 Roles For Artificial Intelligence In Education. Retrieved from https://www.thetechedvocate.org/7-roles-for-artificial-intelligence-in-education/

[23] Intelligence Unleashed. Retrieved from https://www.pearson.com/corporate/about-pearson/innovation/smarter-digital-tools/intelligence-unleashed.html

[24] Dragon Professional Review. Retrieved from https://www.business.com/reviews/dragon-professional/

[25] Mlot, Stephanie. AI Beats Human Lawyers At Their Own Game. Retrieved from https://www.geek.com/tech/ai-beats-human-lawyers-at-their-own-game-1732154/

[26] Contract Intelligence. Retrieved from https://www.ftitechnology.com/solutions/contract-intelligence

[27] Tonn. Robot Lawyers Are A Thing Now. Retrieved from http://www.lifeafterlabels.org/category/case-cruncher-alpha/

[28] Marr, Bernard. How AI And Machine Learning Are Transforming Law Firms And The Legal. Retrieved from https://www.forbes.com/sites/bernardmarr/2018/05/23/how-ai-and-machine-learning-are-transforming-law-firms-and-the-legal-sector/#574fae0c32c3

[29] Retrieved fromhttps://www.arnoldfoundation.org/wp-content/uploads/FAQ-PSA-Research.pdf

[30] The Code of Civil Procedure, 1908. Retrieved from https://indiacode.nic.in/acts/8.%20Code%20of%20Civil%20Procedure,%201908.pdf

[31] The Code of Criminal Procedure, 1973. Retrieved from https://indiacode.nic.in/acts/11.%20Code%20of%20Criminal%20Procedure,%201973.pdf

[32] Linn, Allison. Microsoft creates AI that can read a document and answer questions about it as well as a person. Retrieved from https://blogs.microsoft.com/ai/microsoft-creates-ai-can-read-document-answer-questions-well-person/

[33] Ibid.

[34] Introduction to Automatic Text Summarization. Retrieved from https://blog.algorithmia.com/introduction-automatic-text-summarization/

[35] Ghosh, Agamoni. How This Company is Using AI to Simplify Legal Research. Retrieved from https://www.entrepreneur.com/article/299250

[36] ROSS Intelligence. Retrieved from https://www.forbes.com/profile/ross-intelligence/#2d90593e1e85

[37] Sahita, Vikas. How Artificial Intelligence Is Transforming the Legal Services Industry of Asia. Retrieved from https://www.analyticsindiamag.com/how-artificial-intelligence-is-transforming-the-legal-services-industry-of-asia/

[38] Ibid.

[39] Arnold Foundation Launches Expansion of Public Safety Assessment Tool. Retrieved from https://thecrimereport.org/2018/04/25/arnold-foundation-launches-expansion-of-public-safety-assessment-tool/

[40] What factors does the PSA take into account?

About the author
Name: Parth Jain
The author is pursuing his Doctor of Philosophy (Laws) degree from Panjab University, Chandigarh, India and is also serving as a Civil Judge cum Judicial Magistrate in the state of Himachal Pradesh in India.
Mailing address: #466, Sector-9, Ambala City, Haryana, India.
Tel: +91-9888659805
e-mail : adv.parth.jain@gmail.com, parthjainjudge@gmail.com