



APPLICATION OF ARTIFICIAL INTELLIGENCE IN IMPROVING JUDICIAL CASE FLOW MANAGEMENT SYSTEM IN PAKISTAN: A QUALITATIVE STUDY

Shyam Lal

Session Judge and Ph. D Research fellow

School of Law

University of Karachi

Karachi - Pakistan

Syed Irtiza Rizvi

Research Scholar

Information Technology Department

, Sir Syed University of Engineering and Technology

Karachi - Pakistan

syedirtiza.rizvi@hotmail.com

Dr. Ghulam Dastagir

Research Fellow

Dept. of Criminology

University of Karachi

Karachi - Pakistan

chanasar@gmail.com (Corresponding author)

Abstract

Interaction by means of technology has been prominent in both public and private lives of people. Hence technological variation of information has been upgraded through the application of artificial intelligence, delivering an optimistic opportunity for speedy justice. A computer with strong AI exhibits all the behaviors that you would expect from a human. Hitherto, all state institutions are imperative to the functions of the state, with the judiciary holding the category of a nucleus in the system. The laws are disseminated through the courts. Unfortunately, in Pakistan, legal practice remains shy of the ultimate goal, which certainly circumvents the enactment of the judiciary. The number of cases outnumber the holding capacity to resolve them, as the mega pile up is tantamount to the lack of resources at hand. The judicial system is deprived of an effective case-flow management system, which is certainly considered an international best practice in the legal realm. The researcher has explored avenues to incorporate plausible information technology solutions to the problem in existence. Albeit inquiring through doctrinal and non-doctrinal approaches of the qualitative inquiry, the application of artificial intelligence technology in judicial proceedings is available. Only some realms of the judicial procedure are with artificial intelligence



including but not limited to electronic case filing, research, and case-flow management. Hitherto, subsequent finding has alluded after the fact the practical awareness or usage of the system doesn't seem to be an application. Promulgated regulations pertaining to the case-flow management have yet to be ratified through the parliament, tantamount to the lack of concerns, albeit assertions in the governing elite about the issue. Our article envisages of pioneering Artificial Intelligence in Judicial case-flow Management systems of Pakistan, as remedies towards conveyance of quicker justice, e- court services, plausible solutions, and considerate phenomenon. The Case Management System (CMS) is the insightful, interface for administering court justice in the world. It's an international best practice, which applies artificial intelligence as a core tool to implement international best practices. Inevitably, oblivion to this system, will impede progress, as the lack of technological infrastructure, socio-economic corridors, non-optimizing performance generators. Pakistan's current ranking is stuck at 130/160, in judicial affairs in world ranking. The comprehensive analysis and shined in this article will enable enactment of artificial intelligence in the Pakistani judicial system. Apart from the mainstream, the designated fields, to be digitalised will be indicated in the initial phase. The judicial process in the Islamic Republic of Pakistan will be indicative of artificial intelligence technology, alongside the case-flow management system could be programmed for complete digitalization of the judicial backups. Furthermore, this study alludes to the point that AI is a useful rather significant element which can be compatible with the Pakistan judicial system in the fields of e-filing and CMS. AI has a great future and significant work will be done in it so for that purpose we discussed the recent past and future of this field also.

Keywords: Artificial Intelligence, Remote Technology, Judicial Process, Case Flow Management System, Pakistan

Introduction and Background of the Study

Ever since its inception, Pakistan faced great number of legal challenges, primarily of developing a legal framework of her own were at the core of successive governments post-independence. The Judicial System of Pakistan is grappling with a huge backlog of cases due to slow court processes and inefficient case management system. (ShafiUllah & Yousufi 2021, Marvi 2023). As highlighted by World Justice Project, Pakistan's current ranking is stuck at 130/160, in judicial affairs in world ranking. (WJP, 2022) Information and Communication Technology based solutions can enable our judicial system to deliver justice in more efficient manner Delay in providing justice is against the concept of rule of law. Pakistan needs reforms in justice with updating its laws by observing existing realities. Bilal & Khokhar (2021) argued that with initiating the justice reforms program it must ensure the simple procedure rather complex procedures that



means delaying justice and hence justice denied. Justice delayed is a violation of “fundamental human rights” and negatively impacted lives of parties seeking justice. Delay in justice can never contribute to any positive development of a society. This society is imperfect in establishing and expeditious justice.

A quantum leap can be achieved through up gradation of the justice system with application of artificial intelligence. The foremost objective will be reducing carbon paper of the shelves and replacing them by post-modern day techniques including but not limited to e-filing, e-trial and audio-visual links for determining testimony in a hybrid management system. (Khan & Ali 2021) Pakistan is in affirmation of a lot of improvements in order to get benefit from rapidly progressing IT services. Using artificial intelligence (AI) can bring positive results for the judicial system of Pakistan. According to Rohith and Sunil (2021), if cases are tracked manually, information about them would be dispersed, making it lengthy and challenging to group cases of a same nature. Artificial Intelligence has filtered into broad applications in several domains and has grown so prevalent that it is no longer referred to as such. The application of artificial intelligence through the digitalised court systems, presents enormous benefits for the users. These include online accessibility, maintaining timeline call mark confidentiality, accuracy of data, and subsequent access to files and legal information etc. (Ahmed, Muhammad, Pappel & Draheim, 2021) Case Management System (hereinafter, CMS) which is a system software to handle all cases administered by the court over a computer system. According to Zaiton, Othman & Munirah (2012) AI can advance the digitalization of judicial process i.e., recovery of information online, monitoring of performance easily, and can generates statistics automatically.

AI is one of a fields of computer science through which we can build intelligent machines which can act, imagine like humans, and have ability to make decisions on their own. Dhankar & Walia (2020) argued that this field of Artificial Intelligence is the combination of dual words artificial which means something that's made by humans and the word intelligence which involves the ability to think on its own, and this combine makes artificial intelligence thinking power made by human. For reshaping justice administration, the world is using emerging technologies i.e., AI for improving judicial process and delivery efficiently. (Khan & Ali 2021). This paper addresses the efficacy of the usage of modern ICT technology i.e., Artificial Intelligence that is important to enhance the justice delivery for the purpose of fairness within judicial process, resultantly ensuring peace and development through rule of law. (Ibid)

Literature Review

The use of AI in case-flow management system and E-filing in E-courts in not a new phenomenon within world judicial systems. Lin (2015) explained that AI automatically set out and digitalized the case-flow management system without any human intervention. It saves time and cost for physical paper documents. With the help of AI, many countries for instance, China, Japan and Brazil are stepping up their judicial systems. Maria & Kenyon (2016) acknowledging the



globalization and new information technologies put forth strong persuasive influences on remote operations of the court in present-day. Electronic filing allows litigants and court staff to get more of their work done with their laptops / PCs, pay filing fees, to send and receive documents, send and receive court notices to notify other parties, and retrieve court information.(Qasim M. et al 2023; McMillan, Walker& Webster, 1998)

To resolve the issue of backlog of cases within Malaysia, AI is part of its justice system since 2008. Though, in its initial phase in Malaysia, it starts from introducing with e-filing system, and online filing of cases were allowed for litigants instead of filing manually and physically, hence Case Management System (CMS) is part and parcel of courts cases over computer systems. Kiosk systems were used to register attendance of lawyers and litigants by Queue Management System. (Zain, Saman & Yatin 2017; Munirah, 2014; Keong 2017; Saman & Haider 2011; Saman & Haider 2013).

Digitization and globalization with developing mass legislative courts revolutionized our communication systemise legal proceedings in terms of time, these changes have transformed the public sphere, and the context of remote operations of the court has shifted. (Maria & Kenyon, 2016) Japan was ahead due to its technological advances where courts used Artificial Intelligence (AI) for the purpose of decision support system to make the judgment process faster and efficient with Case-Based Reasoning (CBR). (Khan & Ali 2021). Strong AI is sometimes referred to as generic AI by some computer scientists, as it is a wide intellect that isn't limited to a single task. Weak (or narrow) AI is limited to a single activity, such as making product recommendations on Amazon and Google based on keywords entered by the user. A weak AI software doesn't participate in conversation, sense emotion, or learn for the purpose of learning; it simply performs the task assigned to it. (Doug Rose, 2020) At present, research in AI is usually considered as the use of algorithms to solve problems that require cognitive strain. (Floreano & Mattiussi, 2008)

In the year 2015 Sustainability Development Goals (SDGs) a Theme of the United Nations (UN) was developed for the UNs vision for the future. AI technology has the potential to align with each of the objectives and provide both benefits and long-term reliability. The UN SDGs and AI technology are aligned, as are the fundamental qualities that, if extensively employed, might improve sustainability. (Hughes, Dwivedi, Misra, Rana, Raghavan & Akella, 2019) AI technology is used in various schemes i.e., in e-Services, Procurements, HRM, e-Shariah, Information System, and many others. Besides, almost all international agencies and networks have online projects that aim to enhance effectiveness of efficient service delivery for the public good. Case-flow management system established by Pakistani judicial system is one of them.

Studies such as Daugherty & Wilson (2018) supported that the automatic generation of case statistics in the court management system provides uniformed reports in addition to robust results. Organizations which are using artificial intelligence-based systems are constantly rising, altering business and industry, and widening their reach into what were previously thought to be solely



human areas. Helmi (2019) is proponent of electronic registration of cases through which faster process can be ensured. After registration of cases e-notices also ensured and save human interactions. In this way service delivery can be ensured with transparency that ultimately build public trust among citizens and it also ensures online case tracking and access to relevant information about litigation.. Take an example from Malaysian and Indian Judicial system regarding use of Advanced AI and ICT, it can be observed that the advances made their justice system accessible, inexpensive, speedy and can be ameliorate within Pakistani justice system where similar Judicial Structure is available.(Keong, 2017; Khan 2021)

Methodological Information

This research is based on an exploratory case study that aims to explore a phenomenon in Pakistan where lacks earlier studies on the use of AI within justice system to estimate the outcome. To answer the research question in this research work, the researcher primarily adopts qualitative method of research, which involves both doctrinal and non-doctrinal legal research. The doctrinal method deals with black letter approach to legal research, which is purely theoretical in nature. It is directed at using primary and secondary sources to explain the law. (Kharel, 2018; Chynoweth 2008) The research will also make reference to some secondary sources in the form of treatises, law review articles, legal periodicals, and journal articles, opinions of learned authors in textbooks, legislative courts reports and online materials. Information collected from secondary sources on the subject that are relevant for case studies research. (Fleming & Bhosale, 2018; Yin,2013). In answering some of the research questions in this work, as Fylan (2005) proposed, this research may adopt a semi-structured interview with a clear set of instructions for interviews that will provide reliable and comparable qualitative data. (Lacey & Luff, 2001) As enumerated by O'Keeffe & et al (2016), an important advantage of semi-structured interviews is the opportunity for previously unknown information to emerge. Participants can be regarded as experts by experience; therefore, when sufficient opportunity to speak freely is provided, new information can emerge. It involved combine a pre-determined set of open-ended questions and interviews are best suited for understanding people's perceptions and experiences. (Blandford, 2013) Coyne (1997) Taherdoost (2016) argued that experienced participants were selected by Because in qualitative settings the focus is on the quality of data, hence purposive sampling technique is used to get information from the particular person or participants. For exploratory research and in-depth investigation this technique is considered ideal.

Research Findings

For reliable and to identify different aspects of the use of AI in court settings authors put several questions to the IT and AI experts as well as with court users. They were if AI can speedup case management system or helpful in delivering judgements with worldly examples. These questions were about viability, affordability, applicability, intellect capacity of court users, data safety, transparency, excesses other than court settings, and some other aspects. The backlog of the cases



which is crossed two million mark made life of litigants miserable, that is because of prevailing mode of conventional judicial system and where cases are pending for years and years. In that case, a modern case-flow management system is need of time. This phenomenon can be confirmed many secondary sources and research on Pakistani judicial system that is famous for delayed judicial proceedings and ineffective administration of cases. (Mirza 2016; Lakho, 2021)

It was acknowledged by the respondents of the study that from the past decade, the advancement in AI has shown some significant growth. With the passage of time the growth of artificial intelligence (AI) will increase more, and it will get common in present-day businesses and daily life, and increasingly being involved in different sectors. The findings of the study acknowledged that by adopting AI based systems, people of this world would be competent enough to better predict the consequences of humans on the ecosystem and the earth. AI-powered systems will be utilized to create justice inside institutions and eliminate subjectivity and fraud, which may become a hurdle for public-government relation in many countries. It has influenced practically every aspect of human society by delivering more efficient algorithmic solutions and evaluation. While discussing AI systems are described as “logical machines” that could recognize and grasp new information. The human brain is frequently used as an analogy. Alternatively, the brain can be considered a sign for artificial intelligence. When asked how AI helpful to fasten case management systems in Pakistan. The AI expert clarified that with the help of a large dataset, we can train the AI to decide on what case goes to what court and what judge depending upon the suitability amongst these. This can help escalate the more important cases upwards in the queue so they are heard upon first and a judgement can be reached on them as soon as possible. However, both AI and law professionals need to work in harmony and have significant domain knowledge of both the fields in order to complement each other in developing an accurate, practical, robust, and smart case management system.

With data safety protection measures judges and prosecutors can access to their courts cases files wherever they be and may working on different tasks regardless of the time and location. Participants of the study principally agreed that AI registers more organized view of the case information and court staff can work on them comfortably. Searching and retrieval of information through AI registers is easy and faster and just through a clicking and the availability of different searching parameters than in manual registration system. Moreover, data securely stored in the central database from where electronic copies of court cases case easily accessed and hence to eliminate risks of damages and loss of court record. It is proven fact through secondary sources and studies that AI helping judges and other staff to achieve daily court work, tasks more efficiently than before, in this way the process of decision making in courtrooms become faster.

According to an expert of the filed asserted that ICT integration would affect the justice systems for the better because it would remove the delays and discrepancies due to the manual processes that currently take place in the courts. Automating the processes will help in speeding up the chain of operations necessary for a case to be registered/ heard/ judged making space for other pending



cases and hastening the delivery of justice. Hitherto, prosecutors further shared the same dilemma, to reduce paperwork and adopt conventions which are in best practices globally. (Ahmed, 2021)

While replying to an important question on the security of court cases in the electronic-court system while using AI, one of the experts detailed that there are always security concerns in computer systems. Information systems pertaining to sensitive data are more prone to hacking attacks, data leaks, illegal access etc. However, due to this reason there are many security systems and procedures are in place such as encryption, multi-factor authorization and stricter controls over data. If these security measures are put in place with complete transparency and honesty, accordingly, he does not see any security concern over electronic-court systems.

However, barriers and restraints exist, as affirmed by the participants of the study. For example, when to strive to accept new things or bring about change, there has been always hurdles, and AI has no exception. The difficulties range from the technological to the social. The most important challenges with AI, firstly, such flaws arise from a mismatch among epistemological considerations and the professed capabilities of "smart" data processing systems. Secondly, the flaws are due to the social circumstances in which AI research and development takes place. Lastly, there are technological flaws that are either immediate or gradual. While many of the present flaws would be addressed in the upcoming world, further flaws would be very certainly persisted regardless of future progress. Despite the excitement around AI's capabilities in the public discourse, there are number of characteristics that AI is right now incapable of reaching, as the article aimed to demonstrate from a bird's-eye perspective.

About transparency in court process, one of the participants explained that AI can be used in some processes that are not too sensitive such as deciding upon which case gets heard first. However, it cannot be used in the judgement of cases where decisions affect the fates of actual human lives. Besides, we need a significant number of experts, and a huge amount of data on past cases and their judgements to develop the AI algorithms. While carefully replying on a question deposed to an expert about the role of (AI professionals) how they can help judges in decision making or fasten judicial process because judges are overburdened, and conventional system is too poor and slow. According to him, AI can be used to automate basic processes such as deciding which case should be sent for hearing first by deciding upon the urgency/ importance of each case. However, there needs to be a huge dataset to train the AI algorithms for them to be precise and accurate. AI cannot be let to decide upon the judgement of cases themselves as, again, for the algorithm to be perfect and unbiased we need huge datasets of previous cases, their proceedings, and their detailed judgements in order to train our model to replicate the same logic to decide upon cases. While criticizing Pakistani Justice system, he is of the view that here courts are often biased, unjust, and rule in favour of the stronger party, consequently, the AI will also inherit the same bias, unfairness, and flawed logic to make decisions on the cases in the future.

Artificial intelligence program should be tailored to the particular facts and figures of collection



or conditions in which it is utilized. Special skills and expertise are required to perform this evolutionary process, unfortunately few people in this world have these skills. This insufficiency describes why companies and universities are facing difficulty in finding professionals. However, the technical capabilities that artificially intelligent programs may reach are ultimately related to the human capital that may be invested for the sake of improving the software. (Metz 2017) The constraints of accessible human capital are also the boundaries of the potential scope of AI application development and implementation. Another limitation that restricts the scale of abilities that AI based apps can shelter their level of acceptance in the society. To put it another way, artificial intelligence enabled systems will succeed only if they work for socially acceptable reasons.

Regarding the functionality security and use of case record outside the court premises, one participant stated that it is definitely possible to access the court work from outside the courts; however, to ensure safety and security, only the work that is deemed as non/ less sensitive should be made accessible from outside the court otherwise there is a strong possibility of the sensible data being compromised. Participants of the study agreed that significant improvements in the areas can be seen i.e., transparency in the internal daily operation can be easily automated, for security of court cases all security measures are in place, there is no security concern. Moreover, for extended access to the judiciary through remote access, allowing professionals to access work from outside the courts can be very convenient and allow for small tasks to be done ASAP from anywhere without needing to visit court. Also, electronic registers with a more organized view can be easily done without even needing any sort of AI. The document generation that is accelerating the judgment process can be easily done without even needing any sort of AI through any customized software solution. Given the AI is well trained on large amounts of accurate and unbiased data, this is achievable. Through AI more robust and faster statistics can also be done with any software system even without needing AI.

By more advancement in AI, the case analysis, application and resolution are possible as early as possible. The participants agree that the ICT integration would improve the surveillance and investigation while making analysis procedures easier. It is most helpful for quicker case deposition which will help the judiciary system to finish the huge number of pending cases. AI can be helpful in cases where the facts are undisputed, the law is clear without any ambiguity, and there are well established precedents exist already, the AI software could diagnose the situation and produce a draft order/judgement for the judge to review. ICT have a profound effect on the practice of law. ICT integration with the judicial system has brought new opportunities in courts toward improved efficiency, quality and transparency of court cases. The manual system is slowing down the justice system. If the AI system comes in the court the work and the justice become faster and everyone can take benefit from it. When a practicing lawyer were approached for this study, he acknowledged that he is using this case management system only to see the daily diary of cases in the District Court of Sindh. According to him the High Court case management system is incomplete and not useful as compared to the District Court case management system for the



reason that it does not provide complete case diary/order of court/progress specifically/we have to read case orders from Court File in person in High Court.

However, every locality has its own drawbacks. During the study it was highlighted that availability of AI technology, fast Internet browsing, lack of training of staff, and lack of interest, unwillingness to commit to a reform from the authorities and judicial leadership, this process takes considerable time for implementation. Hence, as per findings from the participants of the study as well as from literature review it is suggested that strong push back is expected from the bar, for wasted interests some groups of lawyers want to continue delaying proceedings that benefit them in destroying evidence and witnesses.

Discussion and Analysis on Major Findings

Through the findings of this study, it is established that failure to expedite justice, is the resultant of the lack of technological infrastructure in Pakistan, including but not limited to backlogs, pressured motives, and intricacy. Pioneering steps need to be initiated through ratifying laws, which are conducive, plausible, and intentionally applicable to the usage of artificial intelligence in the centre crux of judiciary in Pakistan. Hitherto, impeding manoeuvres should be taken notice of, from all possible angles of the judiciary. Timeline plays a crucial role in the processing of a legal case. Corroborative evidence can expire alongside mainstream clues get manipulated. The overburdened judges panel is unable to decide in the right frame of mind.

From the above major findings, it can be concluded while focusing on future work in AI, it is believed that in future trending research topics will be related to huge amount of data-driven AI, which will taking assistance from immense amounts of data and process them with extremely powerful and efficient hardware in order to explore how they refer to each other, detect different types of patterns, and it will be using probability or analytical approaches to learn things like deep-learning systems. (Bengio 2009) Nonetheless, in the future, it will be a requisite for systems having large amount of data or information to add a type of code or software program that will have ability to explain how the outcomes they suggest were gained, and the reason for doing this is to prepare the intelligent to describe introduce or describe itself.

As can be confirmed from several studies from different countries i.e., for example, in Brazil by using AI distribution of cases are done successfully, and in Russia, AI is used to generate and accelerate the judgment process, resultantly faster case disposal. After decision AI is facilitating generation of judgements and other relevant documentations electronically. Moreover, in India, faster case disposal through automatic roster preparation is observed with the help of AI algorithm. Furthermore, in China, an “intelligent court system” were introduced by with “on-call” and “non-stop” judges with a transparent process and optimized the process of judgements by using AI. (Putrijanti & Wibawa, 2021)



The system's ability or smartness will help you to comprehend how it operates plus assess its dependability. Additionally, explicability is required to solve or overcome likely software bugs and identify if the training data was modified or altered. Moreover, we should determine whether outcome or findings are true for the appropriate reasons, or it is a coincidence that we get the correct result in the training data. As a result, the construction of interpretable techniques to these complicated learning systems is considered as one of the most significant research problems in the area of deep learning.

A viable strategy would be to train not just the deep-learning system, but also other system, replicating the deep-learning one, using a simple and transparent representation, utilizing the same data set. Verification and authentication of the system which is used in implementing the learning algorithms is considered as another research issue currently. This is extremely crucial in precarious applications for example autopilot mode in self-driving cars. In these circumstances, there is a need of mechanism for verifying and validating high degrees of accuracy for machine learning systems. A concept now under consideration is adversarial learning, which is required to train another AI system with the aim to destroy the learning algorithm by identifying its weak points. When we talk about visual recognition, like the adversarial system, produces images with an attempt to mislead the learning system by creating the incorrect judgement. (Ramon López de Mántaras *Mètode Science Studies Journal*, 2018).

The expanding usage of AI has the opportunity to assist many elements of society in the long run, as humans are free to focus on tasks demanding greater cognitive load while computers handle more basic chores. However, while this image of a community that benefits from the advent of AI is plausible, the short to medium term transition may have a severe influence on many sensitive parts of society. Governments and companies must devise practical measures to train and reskill workers to ensure that humans are not disenfranchised as a result of the implementation of AI in the field. Because people are likely to remain in the cycle alongside intelligent robots, workers will continue to play an important role within firms as AI-based computers support human pursuits. Plenty of the UN SDGs could benefit directly or indirectly from AI deployment as society evolves to include AI technologies in domains where humans do not regard technological method as attendant, controller, or interactive mates, there will be no more growth related to technologies.

These difficulties might be eliminated digitally with the help of IT. The use of artificial intelligence and common algorithms can aid in grouping situations of a similar kind using data in the form of a structured database. As a result, departments will have time to draught a joint response to these complaints, which can then be argued in court as a single, clubbed case. The idea of “smart data collection”, as discussed by Sousa et al, (2022), needs to be prevailed. Authors discussed that comparing this method to traditional analytics, one advantage is that it is less prone to human interpretation bias or subjectivity. For instance, if any user chooses any specific of the court’s name when submitting a case, the AI backed system will give whole data within specific time.



The system will be able to tell you, when choosing an attorney, what proportion of cases they have won in the past.

Globally ICT and AI technology is being used and developed in the legal sector extremely quickly. When the facts are fully established and simpler to write, it is expected that the AI based technologies will be utilized more frequently. Even in complex and difficult instances, the technology-based trial mode may be implemented. It is mostly based on the advancements in machine deep learning and neural networks. Further efforts should be focused on increasing the application proficiency in legal proceedings. In case of Pakistan's legal system, we are still very behind in getting benefit from the advancement of technology. There are thousands of pending cases in Pakistani courts and these delays can be minimized using Artificial Intelligence. This paper makes a contribution by attempting to explain every step of the judicial application of AI through careful incorporation with the established judicial model. The purpose of the study is to illustrate how artificial intelligence can help in the field of justice, as well as its functional expectations, restrictions, and hazards. Additionally, it examines the legal implications of artificial intelligence, the ethical concerns brought on by its advancement, the reaction impulse, the complete integration barriers of AI and legal reasoning, and potential problem-solving approaches. Furthermore proper training of court staff, lawyers and judges should be mandatory especially at the start of any new application or software. Pakistan can get its pending cases issues resolved by optimal utilization technology-based systems for its legal proceedings.

Recommendations and Conclusions

The emphasis should be switched away from developing pattern recognition algorithms and toward automated recognition of causal linkages. Robots must be trained fundamental with physical and psychological concept so that the information build can be supplemented with relevant scenarios in judiciary. Computers should not be restricted to analyze abstract data bits and should be able to reveal fundamental contexts of meaning, likewise people never merely see sensory input, but always clarify or make it understandable. Machines must study to learn so that information could be used in new situations and activities faster and more precisely. Moreover, there are other distinctions between human mental capabilities and computer "cognitive" skills. Despite significant advances in AI, humans have consistently outperformed computers in performing duties like group creation, learning different speech and recognition it, innovation, second sight, optical awareness in complicated scenarios, and many more. While humans surround learning processes with fundamentals of space, time, number, object permanence, and causality, computers lack this knowledge and should be programmed mechanically.

Conclusively, the debate was convened at the strikers point, to modify the judicial appliances, thus by introduction of a brand-new management system which will certainly unlock pressure prisms. Post-modernism demands, expedition of justice channels through application of Artificial Intelligence. AI is evolving at a far faster rate than anticipated. Even ten years ago, no one could



have predicted that a computer program would soon defeat the human champion at Go. In the coming years, AI will undoubtedly play a significant role in society; in fact, it is already playing and commenting on its two main types, strong and weak AI, necessitating additional study and development in the case of strong AI. Based on above, it is to suggest that justice reforms are the need of the hour otherwise justice delayed will hinder the realization of an approachable, speedy, and effective justice within Pakistan.

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References

- Ahmed, R.K., Muhammed, K.H., Pappel, I. and Draheim, D. (2021), "Impact of e-court systems implementation: a case study", *Transforming Government: People, Process and Policy*, Vol. 15 No. 1, pp. 108-128. <https://doi.org/10.1108/TG-01-2020-0008>.
- Amrit Kharel, "Doctrinal Legal Research", *Available at SSRN 3130525*, (2018): 1-4; See, Paul Chynoweth, "Legal research", *Advanced research methods in the built environment*, (2008): 32.
- Ann E. Blandford, "Semi-structured qualitative studies", *Interaction Design Foundation*, (2013): 23.
- Anne Lacey and Donna Luff, *Qualitative data analysis*, (Sheffield: Trent Focus, 2001), 5.
- Artificial Intelligence for Business, 2nd Edition
- Atif Mirza, A. (2016) Delays and lapses in Pakistan's criminal justice system. *South Asia@ LSE*;
- Bengio., Y. (2009). Learning deep architectures for AI. *Foundations and Trends in Machine Learning*, 2(1), 1–127. doi: 10.1561/22000000006.
- Bilal, M., & Khokhar, F. (2021). Justice Delayed or Denied: The Myth of Justice in Pakistan. *Journal of Law & Social Studies (JLSS)*, 3(2), 124-132.
- Critical Analysis of Legal Systems in Pakistan, Malaysia, and India. *JL & Soc. Pol'y*, 26.
- Coyne, I. T. (1997). Sampling in qualitative research. Purposeful and theoretical sampling; merging or clear boundaries?. *Journal of advanced nursing*, 26(3), 623-630.
- Daugherty, P. R., & Wilson, H. J. (2018). *Human+Machine: Reimagining work in the age of AI*. Harvard Business Press, retrieved from <https://data.gov.in/catalog/estimated-number-enterprises-different-statesuts>.
- Doug Rose, *Artificial Intelligence for Business*, 2nd Edition, December 2020, Publisher(s): Pearson FT Press, ISBN: 9780136556565.
- Fiona Fylan, "Semi-structured interviewing", *A handbook of research methods for clinical and law psychology*, vol. 5, no. 2 (2005): 65-78.
- Floreano D., Mattiussi C. *Bio-Inspired Artificial Intelligence: Theories, Methods, and Technologies* / D. Floreano, C. Mattiussi, The MIT Press, 2008.



- Heng Lin, L. (2015). *Adequacy of e-filing adoption by Malaysian courts* (Doctoral dissertation, Multimedia University).
- Hughes, L., Dwivedi, Y. K., Misra, S. K., Rana, N. P., Raghavan, V., & Akella, V. (2019). Blockchain research, practice and policy: Applications, benefits, limitations, emerging research themes and research agenda. *International Journal of Information Management*, 49, 114–129.
- James E McMillan, J Douglas Walker and Lawrence P Webster, *A Guidebook for Electronic Court Filing* (West Group 1998).
- Jimmy O'Keeffe and et al, “The use of semi-structured interviews for the characterisation of farmer irrigation practices”, *Hydrology and Earth System Sciences*, vol. 20, no. 5 (2016): 1913.
- Keong, G. C. (2017). Judicial Reforms through the Use of Technology in Malaysia. *European Academic Research*, 1, 399-409.
- Khan, A., & Ali, A. B. (2021). Electronic Court System and Speedy Justice: A Comparative Critical Analysis of Legal Systems in Pakistan, Malaysia, and India. *JL & Soc. Pol'y*, 26.
- Lakho, M. K. (2021). Social reasons for and repercussions of judicial delays in Subordinate Courts of Karachi: the need for sociological analysis. *Sri Lanka Journal of Social Sciences*, 44(2), 181-197.
- Lucas, P., Fleming, J., & Bhosale, J. (2018). The utility of case study as a methodology for work-integrated learning research. *International Journal of Work-Integrated Learning*, 19(3), 215-222
- Maria Edström, and Andrew T. Kenyon, *Blurring the Lines: Market-driven and democracy-driven freedom of expression*, (Nordicom, 2016), 20.
- Metz C (2017) Tech giants are paying huge salaries for scarce A.I. talent. <https://www.nytimes.com/2017/10/22/technology/artificial-intelligence-experts-salaries.html>.
- Minal Dhankar, Nipun Walia, (2020) “An Introduction to Artificial Intelligence”, Maharaja Surajmal Institute ISBN: 978-93-86238-93-1. derived from (<http://msi-ggsip.org/wp-content/uploads/conference2020.pdf#page=118>).
- Munirah Mohamad, A. (2014). Using ATLAS. ti 7 for Researching the Socio-Legal Implications



of ICT Adoption in the Justice System of the High Courts of Malaysia. ATLAS.ti User Conference 2013 : Fostering Dialog on Qualitative Methods, 1–11.

Pakistan: World Justice Project.(2022) World Justice Project. Accessed August 2, 2022. www.worldjusticeproject.org/rule-of-law-index/country/2022/Pakistan/pakistan/2021.

Qasim M. et al (2023), “Use of Artificial Intelligence for Better and Rapid Criminal Justice System”, Journal of Xi'an Shiyou University, Natural Science Edition ISSN: 1673-064X. VOLUME 19 ISSUE 02 FEBRUARY 2023 1330-1344.

Qazi, Marvi,(2023) Infusing Digital Technology in Judicial Operations in Pakistan: A Critical Analysis of Global Best Practices and Local Initiatives. Available at SSRN: <https://ssrn.com/abstract=4378378> or <http://dx.doi.org/10.2139/ssrn.4378378>.

Putrijanti, A., & Wibawa, K. C. S. (2021). The implementation of e-court in administrative court to develop access to justice in Indonesia. *Journal of Environmental Treatment Techniques*, 9(1), 105-109.

Ramon López de Mántaras Mètode, Towards Artificial Intelligence Advances, Challenges, And Risks, *Science Studies Journal* (2018). University of Valencia. DOI: 10.7203/metode.9.11145 ISSN: 2174-3487 / eISSN: 2174-9221. Article received: 12/12/2017, accepted: 23/07/2018.

Saman, W. S. & Haider, A. (2011). The Implementation of Electronic Records Management System: A Case Study in Malaysian Judiciary. *AMCIS 2011 Proceedings All Submissions*, 1– 12.

Saman, W. S., & Haider, A. (2013). E-Shariah: Information and Communication Technologies for Shariah Court Management. *Legal Information Management*, 13(2), 94–106. <http://doi.org/10.1017/S1472669613000248>.

Taherdoost, H. (2016) Sampling methods in research methodology; how to choose a sampling technique for research. *How to choose a sampling technique for research (April 10, 2016)*.

Ullah, S., & Yousufi, M. (2021). Usage Of Information and Communication Technology Tools in Courts and Its Implications: A Case Study of Islamabad High Court. *International Journal of Policy Studies*, 1(1).

Yin, R. K. (2013). *Case study research: Design and methods*. Thousand Oaks, CA: Sage.



Zain, N. A. M., Saman, W. S. W. M., & Yatin, S. F. M. (2017). Managing Electronic Records in Malaysian Civil Courts: A Review of Literature. *International Journal of Academic Research in Business and Social Sciences*, 7(8), 909-919:

Zaiton H., Mohd B.. Othman and Ani M. M., 'Benefits and Achievements of ICT Adoption by the High Courts of Malaysia' (IEEE 2012) 1234.