



VIRTUAL COURTS, REAL BARRIERS: THE DIGITAL DIVIDE, ARTIFICIAL INTELLIGENCE, AND THEIR IMPACT ON ACCESS TO JUSTICE

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Abstract

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As virtual courts become an increasingly prevalent mechanism for legal proceedings, the digital divide presents significant barriers to equitable access to justice. This paper will explore the critical impact of technological disparities on the efficacy and fairness of virtual court systems. The digital divide, which encompasses the gap between individuals with and without access to digital technologies and the internet, disproportionately affects marginalized and low-income communities. These disparities manifest in various ways, including limited access to necessary devices, unreliable internet connections, and insufficient digital literacy.

Virtual Court, which leverage video conferencing and online platforms to conduct legal proceedings, offer potential benefits such as increased efficiency and broader accessibility. However, they also exacerbate existing inequalities in the justice system. For individuals lacking reliable technology or the skills to navigate digital platforms, participating in virtual court processes can become a significant hurdle, compromising their ability to fully engage with legal proceedings and



potentially undermining their right to a fair trial. The impact of the digital divide on virtual courts raises crucial questions about the inclusivity and fairness of these systems. This paper highlights the need for targeted interventions to bridge the technological gap, such as improving access to digital resources, providing training and support, and implementing policies to ensure that virtual court systems are accessible to all individuals, regardless of their socioeconomic status. Addressing these barriers is essential for upholding the principle of justice and ensuring that the benefits of virtual courts do not inadvertently widen existing disparities.

Introduction

Virtual court refers to a judicial process conducted through digital platforms rather than in a physical courtroom. This includes hearings, trials, and other legal proceedings carried out via video conferencing, online document submission, and digital communication tools. Virtual courts became especially common during the COVID-19 pandemic when physical courtrooms were closed or restricted¹. They allow judges, lawyers, defendants, and witnesses to participate remotely, ensuring the continuation of legal processes while minimizing in-person contact.

Key features of virtual courts include video conferencing for real-time interaction, e-filing of legal documents, the presentation of digital evidence, and online case management systems². The primary aim is to make justice accessible, efficient, and timely, even when in-person court sessions are not possible. The need for virtual courts stems from several factors that make the judicial system more adaptable to modern challenges. Virtual courts improve accessibility, allowing people who might have difficulty attending in person due to distance or mobility issues to participate. They also ensure the continuity of justice during

¹ Nir, E., & Musial, J. (2022). Zooming in: Courtrooms and defendants' rights during the COVID-19 pandemic. *Social & Legal Studies*, 31(5), 725-745.

² Alkon, C., & Schmitz, A. (2023). Opening the Virtual Window: How on-Line Processes Could Increase Access to Justice in the Criminal Legal System. *Cardozo J. Conflict Resol.*, 25, 177.



emergencies, like the COVID-19 pandemic, by preventing delays and backlogs when physical courts are closed.

Efficiency is another key reason for virtual courts, as they streamline processes such as document submission and case management, reducing the time and resources needed for court proceedings³. They are cost-effective, saving on travel, lodging, and other logistical expenses for both the court system and participants.

Virtual courts also enhance safety by minimizing in-person interactions, which is crucial during public health crises. Their flexibility allows for easier scheduling, as participants can join from different locations, making it possible to accommodate various time zones and availability. Finally, advancements in technology have made virtual courts a practical and effective solution, helping the legal system function more smoothly in a digital age. Virtual courts, while offering many benefits, also face several challenges that need to be addressed for effective implementation. One of the primary challenges is digital infrastructure. Many regions lack reliable internet connectivity, especially in rural or underserved areas, which can hinder participants from accessing virtual court proceedings. Additionally, the need for proper equipment, such as computers, cameras, and microphones, can be a barrier for some individuals or institutions.

Technological literacy is another issue. Not all participants, including judges, lawyers, and litigants, may be comfortable using digital tools, leading to difficulties in navigating virtual court systems⁴. Training and support are essential to bridge this gap, but it requires time and resources.

Privacy and security concerns are significant challenges as well. Ensuring that sensitive legal information remains confidential and protected from cyber threats is crucial. Virtual courts must implement robust cybersecurity measures to prevent data breaches and unauthorized access⁵. Fairness and accessibility are also concerns. Not everyone has equal access to technology, and those without it may be disadvantaged

³ Djamaludin, D., Aziz, M. F., Ar-Rasyid, Y., & As-Sayyis, I. A. (2023). Assessing the Impact of Electronic Court Systems on the Efficiency of Judicial Processes in the Era of Digital Transformation. *Volksgeist: Jurnal Ilmu Hukum Dan Konstitusi*, 1-18.

⁴ Rossner, M., & Tait, D. (2023). Presence and participation in a virtual court. *Criminology & Criminal Justice*, 23(1), 135-157.

⁵ Awaisheh, S. M. (2023). Digital Justice in Jordan: The Role of Virtual Arbitration Sessions in Modernizing the Legal System. *International Journal of Cyber Criminology*, 17(1), 146-165.



in virtual court settings. This digital divide can exacerbate inequalities within the justice system. Legal and procedural issues arise too, as laws and regulations may need to be updated to accommodate virtual court processes⁶. Questions about the admissibility of digital evidence, the validity of remote testimonies, and the enforcement of judgments in a virtual setting need to be addressed. Lastly, maintaining the integrity and solemnity of court proceedings can be challenging in a virtual environment. Ensuring that participants take the process seriously, without distractions or inappropriate behavior, is vital to upholding the dignity of the court.

Real Barriers of Virtual Court

The real barriers to virtual courts involve several practical, legal, and social challenges that complicate their widespread adoption.

First, digital inequality is a significant barrier. Not everyone has access to the necessary technology, such as reliable internet connections, computers, or smartphones. This digital divide disproportionately affects low-income individuals, rural communities, and older populations, limiting their ability to participate effectively in virtual court proceedings⁷.

Technological infrastructure is another critical barrier. Even in more developed areas, issues like unstable internet connections, power outages, and software glitches can disrupt virtual court sessions. Courts themselves may lack the necessary digital infrastructure, including secure platforms for video conferencing and online case management.

⁶ McDonald, H. (2020). Assessing Access to Justice: How Much "Legal" Do People Need and How Can We Know?. *UC Irvine L. Rev.*, 11, 693.

⁷ Norton, K. L. (2022). Accessing Justice in Hybrid Courts: Addressing the Needs of Low-Income Litigants in Blended in-Person and Virtual Proceedings. *Geo. J. on Poverty L. & Pol'y*, 30, 499.

Cybersecurity risks pose serious concerns. Virtual courts handle sensitive information that must be protected from data breaches, hacking, and unauthorized access⁸. Ensuring robust cybersecurity measures requires significant investment, and any failure in this area could undermine trust in the judicial system⁹.

Technological literacy is also a barrier. Many participants, including judges, lawyers, and litigants, may not be familiar with the digital tools required for virtual court processes¹⁰. This can lead to difficulties in conducting hearings smoothly and fairly, as well as the need for additional training and support.

Legal and procedural adaptations present challenges as well. The legal framework governing courts was primarily designed for in-person settings, and adapting these laws to a virtual environment is complex¹¹. Issues like the validity of digital signatures, the admissibility of electronic evidence, and ensuring that remote testimonies are credible all need to be carefully considered and legislated.

Maintaining the formality and integrity of court proceedings is another barrier. Virtual settings can sometimes lead to a more casual atmosphere, which may undermine the seriousness of the proceedings¹². Ensuring that all participants maintain the proper decorum and that the judicial process is respected can be difficult in a virtual environment¹³.

Finally, resistance to change from within the legal profession is a barrier. Many legal professionals and court staff are accustomed to traditional in-person processes and may be hesitant or resistant to adopting virtual methods¹⁴. Overcoming this inertia requires significant effort in terms of training, policy changes, and cultural shifts within the judiciary.

⁸ Awaisheh, S. M. (2023). Digital Justice in Jordan: The Role of Virtual Arbitration Sessions in Modernizing the Legal System. *International Journal of Cyber Criminology*, 17(1), 146-165.

⁹ Kayode-Ajala, O. (2023). Establishing cyber resilience in developing countries: an exploratory investigation into institutional, legal, financial, and social challenges. *International Journal of Sustainable Infrastructure for Cities and Societies*, 8(9), 1-10.

¹⁰ Bender, M. (2021). Unmuted: Solutions to safeguard constitutional rights in virtual courtrooms and how technology can expand access to quality counsel and transparency in the criminal justice system. *Vill. L. Rev.*, 66, 1.

¹¹ Ferguson, A. G. (2022). Courts without court. *Vand. L. Rev.*, 75, 1461.

¹² Bandes, S. A., & Feigenson, N. (2020). Virtual trials: Necessity, invention, and the evolution of the courtroom. *Buff. L. Rev.*, 68, 1275.

¹³ Philp, G. (2022). Listening and Responding to the Future of Virtual Court.

¹⁴ Bender, M. (2021). Unmuted: Solutions to safeguard constitutional rights in virtual courtrooms and how technology can expand access to quality counsel and transparency in the criminal justice system. *Vill. L. Rev.*, 66, 1.

Addressing the barriers to virtual courts requires a multifaceted approach that involves improving technology access, enhancing digital literacy, and reforming legal frameworks. Here are some strategies that can help overcome these challenges:

1. Improving Digital Infrastructure: Governments and judicial systems need to invest in expanding high-speed internet access, particularly in rural and underserved areas¹⁵. Public-private partnerships can also play a role in ensuring that all regions have the necessary digital infrastructure. Additionally, courts should be equipped with reliable technology, including secure video conferencing platforms and online case management systems.

2. Bridging the Digital Divide: To ensure that all participants have access to the necessary technology, programs could be implemented to provide low-cost or free devices and internet services to those in need¹⁶. Public institutions like libraries and community centers can also be equipped to offer access to virtual court facilities¹⁷.

The digital divide refers to the gap between individuals, households, or communities that have access to modern information and communication technology (ICT) and those that do not. This divide can manifest in several ways:

a) Access to Technology: Some people have access to devices like computers, smartphones, and high-speed internet, while others do not. This is the most obvious aspect of the digital divide.

b) Quality of Access: Even among those who do have access, there can be disparities in the quality of that access. For example, someone may have internet access but at very slow speeds, or they may have outdated devices that limit their ability to use certain online services effectively.

¹⁵ Blackwater, D. (2020). Broadband internet access: A solution to tribal economic development challenges. *Indigenous Peoples' JL Culture & Resistance*, 6, 93.

¹⁶ Kumm, A. J., Viljoen, M., & de Vries, P. J. (2022). The digital divide in technologies for autism: feasibility considerations for low-and middle-income countries. *Journal of Autism and Developmental Disorders*, 1-14.

¹⁷ Hasan, M. I., & Mia, B. (2021). Initiation of virtual court system during COVID-19 pandemic and e-judiciary: challenges and way forward. *Daengku: Journal of Humanities and Social Sciences Innovation*, 1(1), 8-17.

c) Digital Literacy: The digital divide also includes differences in the skills and knowledge needed to use technology effectively. Even with access to the latest technology, individuals may not benefit fully if they lack the necessary digital literacy to use these tools.

d) Affordability: The cost of technology and internet services can create a divide. Some people may have access to the internet but cannot afford consistent or high-quality service, limiting their ability to participate fully in the digital world.

e) Geographical Barriers: Rural or remote areas often face a digital divide due to limited infrastructure, making it harder for people in these locations to access reliable internet and modern technology.

The digital divide has significant social, economic, and educational implications. Those without access to technology are often at a disadvantage when it comes to job opportunities, education, healthcare, and even civic participation. Bridging this divide is crucial for ensuring equal opportunities in an increasingly digital world.

3. Enhancing Cybersecurity: Robust cybersecurity measures are essential to protect sensitive legal information in virtual courts¹⁸. This includes using secure platforms, encrypting communications, and implementing strict access controls. Courts should also have protocols in place to respond to potential cyber threats and breaches.

4. Providing Training and Support: Comprehensive training programs for judges, lawyers, court staff, and litigants on how to use digital tools effectively can reduce technological literacy barriers¹⁹. Ongoing technical support should also be available during virtual proceedings to address any issues that arise in real-time.

5. Legal and Procedural Reforms: Laws and regulations need to be updated to accommodate virtual court processes. This includes clarifying the admissibility of digital evidence, ensuring the validity of remote testimonies, and setting standards for virtual proceedings. Legal frameworks should be flexible enough to adapt to evolving technologies while ensuring fairness and justice.

¹⁸ Herliana, H., & Sujayadi, S. (2023, December). Virtual Arbitration Proceeding: Promising Efficiency, Reaping Risks. In International Conference on “Changing of Law: Business Law, Local Wisdom and Tourism Industry”(ICCLB 2023) (pp. 531-543). Atlantis Press.

¹⁹ Dahan, S., & Liang, D. (2020). The case for AI-powered legal aid. Queen's LJ, 46, 415.



6. Maintaining Courtroom Decorum: Guidelines should be established to maintain the formality and integrity of virtual court proceedings. This might include setting expectations for dress codes, behavior, and minimizing distractions during virtual hearings. Judges can play a role in enforcing these standards to ensure the seriousness of the proceedings is upheld.

7. Building Confidence and Trust: Efforts should be made to build trust in virtual courts among legal professionals and the public. This can be achieved through pilot programs, success stories, and transparent communication about the benefits and safeguards of virtual court systems.

8. Encouraging Cultural Shifts: Overcoming resistance to change within the legal profession requires promoting the benefits of virtual courts and encouraging a mindset shift. This can be facilitated through professional development programs, seminars, and engagement with legal associations to highlight how virtual courts can complement traditional methods and improve access to justice.

By addressing these barriers through a combination of technological improvements, legal reforms, and cultural changes, the potential of virtual courts can be fully realized, making the judicial system more accessible, efficient, and resilient.

Artificial Intelligence

Artificial intelligence (AI) involves creating machines and systems capable of performing tasks that usually require human intelligence, such as problem-solving, learning, reasoning, and understanding language. AI systems process information, recognize patterns, make decisions, and adapt based on experience, imitating aspects of human thinking.

There are different levels of AI. Narrow AI, or weak AI, is designed for specific tasks, like virtual assistants, recommendation algorithms, or AI systems in medical diagnostics. It operates within set parameters and doesn't have general intelligence or self-awareness. General AI, or strong AI, refers to systems that can understand, learn, and apply knowledge across various tasks, similar to human intelligence, though this level of AI doesn't yet exist.

Machine learning a subset of AI, involves algorithms that allow systems to learn from data and improve over time without explicit programming for every task. For instance, a machine learning model can be trained to recognize images, detect fraud, or predict trends. Deep learning, an advanced subset of machine

learning, uses neural networks with many layers to analyze complex data patterns. This is used in applications like image recognition, speech recognition, autonomous vehicles, and natural language processing.

AI is widely applied in fields like healthcare, finance, transportation, and entertainment²⁰. However, it also brings challenges, such as job displacement, privacy concerns, and the need for regulations to ensure ethical and responsible use. The Vidhi Centre for Legal Policy, an independent think-tank, emphasizes that while AI can enhance the efficiency of the justice system, it is essential to remember that real people are affected by these technologies. Their research highlights the need for a comprehensive legal, regulatory, and ethical framework to build trust in AI within the justice system. Implementing AI must be done with transparency, fairness, and accountability, and there should be proper training for judges, lawyers, and public servants to mitigate potential AI-related risks. Tawfik Jelassi, UNESCO's assistant director-general for communication, stresses the urgency of enacting new laws and taking immediate action.

Delays in justice can have serious consequences, as demonstrated by the Naz Foundation case on Section 377, which took 624 days for a ruling²¹. Research indicates a link between judicial delays and economic growth. A 2018 report by the Institute for Economics and Peace found that India's inability to deliver timely justice and uphold the rule of law resulted in preventable violence, costing the country up to 9 percent of its GDP annually.

India faces significant challenges with over 4.32 crore pending cases and a shortage of judges, with high courts and subordinate courts operating with 30 percent and 22 percent fewer judges than sanctioned. In this context, AI offers a promising solution to accelerate the delivery of justice, making its integration into the legal system a positive step forward.

²⁰ Sarker, I. H. (2022). AI-based modeling: techniques, applications and research issues towards automation, intelligent and smart systems. SN Computer Science, 3(2), 158.

²¹ Dent, K. (2021). Lawfare and legitimacy: The wicked problem of judicial resilience at a time of judicialisation of politics in South Africa.

Role of Artificial intelligence in the Virtual Court

Artificial intelligence (AI) is beginning to play a role in the Supreme Court of India, albeit at a nascent stage²². The Court has shown interest in leveraging AI to improve judicial efficiency, particularly in handling the massive backlog of cases. AI is being explored for applications such as automating repetitive tasks, assisting in legal research, and streamlining case management. However, the use of AI is still limited and largely experimental.

One notable initiative is the Supreme Court's "SUPACE" (Supreme Court Portal for Assistance in Courts Efficiency) project, launched in 2021. SUPACE is designed to assist judges by gathering relevant facts and legal precedents, thereby helping with quicker decision-making²³. Unlike AI systems that predict outcomes, SUPACE is focused on providing information and improving administrative processes, ensuring that final decisions remain entirely within the judges' purview.

The integration of AI in India's judiciary is seen as a potential game-changer, but it also raises concerns about fairness, transparency, and data privacy. There is ongoing debate about the ethical implications of AI in judicial decision-making, especially in a system as complex and diverse as India's. Experts emphasize that while AI can enhance efficiency, its application must be carefully regulated to avoid biases and ensure that it complements human judgment rather than replacing it.

As the Supreme Court continues to experiment with AI, there is a cautious optimism about its potential to transform the legal system in India. However, the success of these initiatives will depend on how well the technology is integrated and whether it is used in a way that upholds the principles of justice.

Artificial intelligence (AI) can significantly enhance the efficiency and effectiveness of virtual courts in several ways:

²² Bishnoi, R., Kaur, R., Kaur, N., Kaur, H., Kaur, A., & Johal, A. (2024). Utilizing Artificial Intelligence in Legal System with Special Reference of India. *Educational Administration: Theory and Practice*, 30(5), 2217-2223.

²³ Moses, L. B., & Chan, J. (2014). Using big data for legal and law enforcement decisions: Testing the new tools. *University of New South Wales Law Journal*, the, 37(2), 643-678.

- 1. Case Management:** AI can streamline case management by automating scheduling, managing case files, and tracking deadlines²⁴. This helps reduce administrative burdens and ensures that cases are processed more efficiently.
- 2. Document Review:** AI tools can assist in reviewing and categorizing legal documents. Natural language processing (NLP) algorithms can analyze large volumes of text, identify relevant information, and extract key details, making document review faster and more accurate.
- 3. Predictive Analytics:** AI can use historical case data to predict outcomes or suggest likely decisions based on previous judgments. This can help judges and lawyers understand potential case trajectories and make informed decisions²⁵.
- 4. Legal Research:** AI-powered legal research tools can quickly search through vast databases of legal texts, case law, and statutes to find relevant information²⁶. This speeds up the research process and improves the quality of legal arguments.
- 5. Virtual Assistance:** AI chatbots and virtual assistants can provide real-time support to court users, answering frequently asked questions, guiding them through procedures, and offering information about case statuses.
- 6. Speech-to-Text:** AI can convert spoken testimony into written text in real-time, making it easier to generate accurate records of court proceedings and improve accessibility for all parties involved.
- 7. Enhanced Security:** AI can help monitor and protect virtual court environments by detecting unusual activity, preventing unauthorized access, and ensuring the security of sensitive information.
- 8. Bias Detection:** AI tools can analyze judicial decisions to identify potential biases or inconsistencies, helping to promote fairness and transparency in the legal process.

²⁴ Karamthulla, M. J., Muthusubramanian, M., Tadimarri, A., & Tillu, R. (2024). Navigating the Future: AI-Driven Project Management in the Digital Era. *International Journal for Multidisciplinary Research*, 6(2), 1-11.

²⁵ Kluttz, D. N., & Mulligan, D. K. (2019). Automated decision support technologies and the legal profession. *Berkeley Technology Law Journal*, 34(3), 853-890.

²⁶ Kabir, M. S., & Alam, M. N. (2023). The role of AI technology for legal research and decision making. *Title of the Journal*.

By integrating AI into virtual courts, the judicial system can enhance its efficiency, accuracy, and accessibility, making legal processes more streamlined and effective²⁷. However, it's important to ensure that AI applications are implemented with appropriate oversight to address ethical and privacy concerns.

The integration of virtual courts and artificial intelligence (AI) into the judicial system brings both opportunities and challenges that affect access to justice²⁸. Virtual courts offer a way to conduct judicial proceedings without requiring physical presence, potentially making the legal system more accessible. However, this shift highlights the digital divide—the gap between those with and without access to modern technology. People in underserved or rural areas might face issues such as unreliable internet connections, outdated devices, or lack of digital literacy, which can limit their ability to fully participate in virtual court proceedings.

AI can enhance virtual courts by automating tasks, improving case management, and assisting with legal research²⁹. It can streamline document review, predict case outcomes, and provide virtual assistance. However, the use of AI also brings concerns, such as ensuring that AI systems are designed to address potential biases and do not perpetuate inequalities. There are also issues related to data security, making it crucial to implement robust cybersecurity measures to protect sensitive legal information.

The digital divide can exacerbate these issues, as those without adequate technology or digital literacy resources may not benefit from the efficiencies introduced by AI or virtual courts. This can create disparities in legal representation and access to justice, particularly for marginalized or low-income individuals.

To address these challenges, investments in technology and internet access are essential to bridge the digital divide. Expanding broadband coverage and providing affordable devices and internet services are key steps. Training programs can help individuals navigate virtual court systems and use AI tools effectively, ensuring broader participation in the judicial process. Developing AI systems with fairness

²⁷ Said, G., Azamat, K., Ravshan, S., & Bokhadir, A. (2023). Adapting legal systems to the development of artificial intelligence: solving the global problem of AI in judicial processes. *International Journal of Cyber Law*, 1(4).

²⁸ Schmitz, A. J. (2019). Expanding access to remedies through e-court initiatives. *Buff. L. Rev.*, 67, 89.

²⁹ Lal, S., Rizvi, S. I., & Dastagir, G. (2023). Application of artificial intelligence in improving judicial case flow management system in Pakistan: A qualitative study. *Pakistan Journal of International Affairs*, 6(3).



checks and regular audits can help mitigate biases and ensure equitable use. Strengthening cybersecurity measures is crucial to protect sensitive legal data and maintain trust in virtual court systems. Updating legal frameworks to accommodate virtual and AI-enhanced processes can help ensure that these technologies are used effectively and ethically in the judicial system³⁰. By tackling these barriers and implementing supportive measures, the judicial system can better utilize the benefits of virtual courts and AI while striving to maintain equitable access to justice for all³¹.

Conclusion

In conclusion, while virtual courts and artificial intelligence (AI) offer significant potential to enhance the efficiency and accessibility of the judicial system, they also present notable challenges. The digital divide highlights disparities in technology access and digital literacy, which can limit the benefits of these advancements for marginalized or underserved populations. AI introduces both opportunities for improved case management and legal research, and concerns related to bias and data security.

Addressing these challenges requires a comprehensive approach that includes investing in digital infrastructure, enhancing digital literacy, ensuring fairness in AI systems, strengthening cybersecurity, and updating legal frameworks. By tackling these issues, the judicial system can better leverage the benefits of virtual courts and AI, ensuring that advancements in technology contribute to a more equitable and effective justice system. With the help of virtual courts and artificial intelligence, access to justice can be ensured for everyone. This is a very revolutionary step. People will get justice through this but its misuse also needs to be prevented because technology can be easily compromised. Cyber security is a big issue. Until its misuse is completely ensured, promoting its use can prove to be disastrous.

³⁰ Ejjami, R. (2024). AI-driven justice: Evaluating the impact of artificial intelligence on legal systems.

³¹ Gras, I. O. (2021). Online courts: Bridging the gap between access and justice. UCLJLJ, 10, 24.