WORLD BANK GROUP
Development Economics | Global Indicators

Global Indicators Briefs No. 25

Digitizing Court Systems: Benefits and Limitations

Raman Maroz, Oleksandra Popova, and Santiago Satizábal Acosta*

The eagerness with which governments across the world rushed to digitize their court systems during the COVID-19 pandemic might create an impression that new technologies alone can solve the multitude of issues associated with the quality and efficiency of dispute resolution. However, while digitization can indeed contribute positively to the operation of judicial institutions, new technologies constitute only one factor, albeit an important one, affecting the outcomes in the complex, multifaceted system for resolving disputes. The findings in this Brief show that while increased digitization is associated with greater accessibility and transparency within judiciaries, it may not necessarily result in significant improvements in the efficiency of the court processes unless a more holistic approach is considered.

Background on digitization of courts

Even though digitization of courts began as long ago as the 1980s, when personal computers and text processing software appeared, until recently its pace hardly could be described as fast. Only in the past two decades, in addition to the adoption of general hardware and information and communications technologies (ICT), have courts begun to introduce electronic tools and applications tailored specifically to their work. Some jurisdictions gradually enabled the electronic filing of lawsuits and subsequent documents, introduced electronic service of process and electronic payment, or made it possible to communicate with courts electronically (CEPEJ 2016). Following the outbreak of the COVID-19 pandemic, however, the importance of switching to the digital handling of cases and remote communications became apparent. The electronic flow of documents and remote hearings turned out to be the necessary tools to allow court users and judges to carry on their activities during the health crisis (Fabri 2021). As a result, many economies rushed to digitize their court systems to avoid inflicting irreparable harm to the interests of the parties and creating a backlog of cases (OECD 2021).

Over the period 2020–21, the World Bank Development Economics Indicators Group (DECIG) conducted a special data collection exercise in 120 economies, monitoring the introduction of digital features across judiciaries and recording the information on suspension of court services due to safety measures, when applicable. The collected data, which took into account only newly developed applications and tools, indeed showed a spike in reforms aimed at digitizing judicial institutions. More specifically, in 2020, the level of court digitization increased in 43 out of 120 measured economies. The pace of reforms continued to accelerate in 2021, when 77 out of 120 economies introduced additional electronic features in courts.

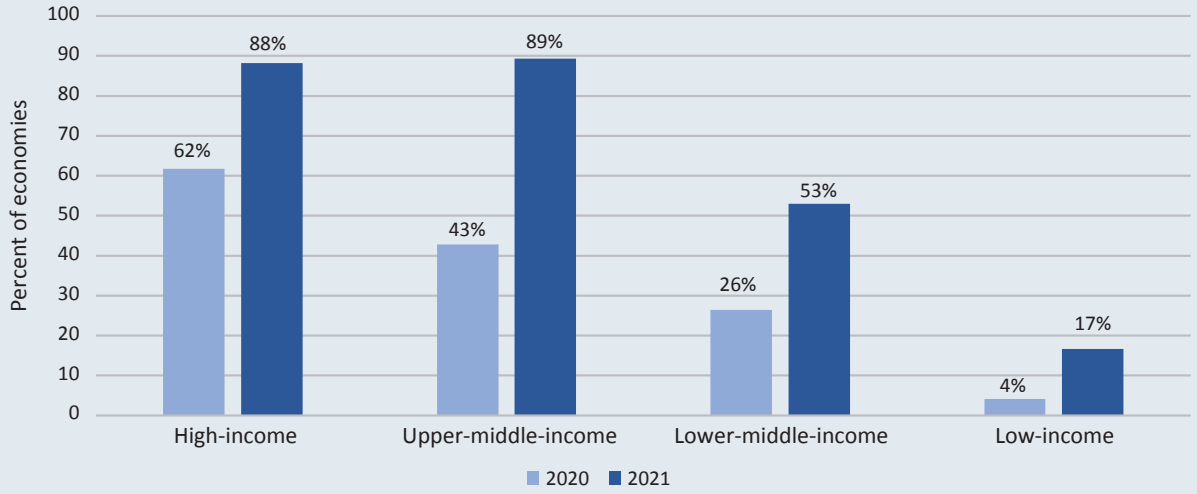
The pandemic, however, also widened the digital divide between developed and developing economies. As illustrated in Figure 1, in both 2020 and 2021, a large share of high-income and upper-middle-income economies were able to swiftly introduce reforms in the area of court digitization as part of their response to the COVID-19 emergency. At the same time, a much smaller portion of lower-middle-income economies had the capacity to provide additional electronic tools. Low-income economies were largely left behind in this process, with only 4 percent of these economies able to increase their court digitization level in 2020, followed by 17 percent in 2021. The gap in court digitization between developed and developing economies, which had already existed before the pandemic, widened even further.

Digitization of courts and access to justice

Access to justice is a cornerstone of any dispute resolution system. When individuals and businesses are denied access to justice, their rights are impaired, which hampers their growth and development. A variety of sources indicate that digitization can improve access to justice. Evidence suggests that new technologies can help litigants by making it easier to find necessary legal information online, allowing electronic filing of documents, providing the possibility to track the progress of cases from home, enabling remote interaction with attorneys, and so on (Cabral et al. 2012). Sending updates to court users about their cases via text messages (SMS) can also enhance access to justice, including for marginalized people, by eliminating the need to travel to courts in order to receive the latest information (Egessa and Cherotich 2017). Moreover, thanks to digitization, even traveling to court to attend hearings may no longer be required, further removing the necessity to take long breaks from work and family (Bulinski and Prescott 2016). Evidence indicates that the use of online platforms for resolving minor disputes may lead to the greater participation of litigants (Prescott 2017). Online dispute resolution mechanisms also offer a unique and easily accessible remedy for settling disputes in the field of transnational e-commerce, sparing consumers and firms from the hardship of dealing with complex jurisdictional matters (Schmitz 2018).

Affiliations: ** World Bank, Development Economics. For correspondence: rmaroz@worldbank.org.*
Acknowledgements: *The authors would like to thank Luisa Daniela Dyer Melhado, Nabintu Olivia Mutambo Mpatswe, and Debasmita Padhi for their great research assistance. The authors are grateful to Varun Eknath, David C. Francis, Norman Loayza, and Valeria Perotti for their helpful comments. Nancy Morrison provided editorial assistance.*
Objective and disclaimer: *This Brief uses novel and unique data on the COVID-19 pandemic and court digitization collected by the Development Economics Indicators Group (DECIG) across 120 economies, as well as data from the Doing Business 2016–2020 reports. Global Indicators Briefs synthesize existing research and data to shed light on a peculiar issue for policy debate. The names of the authors are indicated above and should be cited accordingly. The findings, interpretations, and conclusions are entirely those of the authors. They do not necessarily represent the views of the World Bank Group, its Executive Directors, or the governments they represent. All Briefs in the series can be accessed at: https://www.worldbank.org/en/research/brief/global-indicators-briefs-series.*

Figure 1 Many economies, especially higher-income ones, adopted reforms to digitize their courts during the COVID-19 pandemic



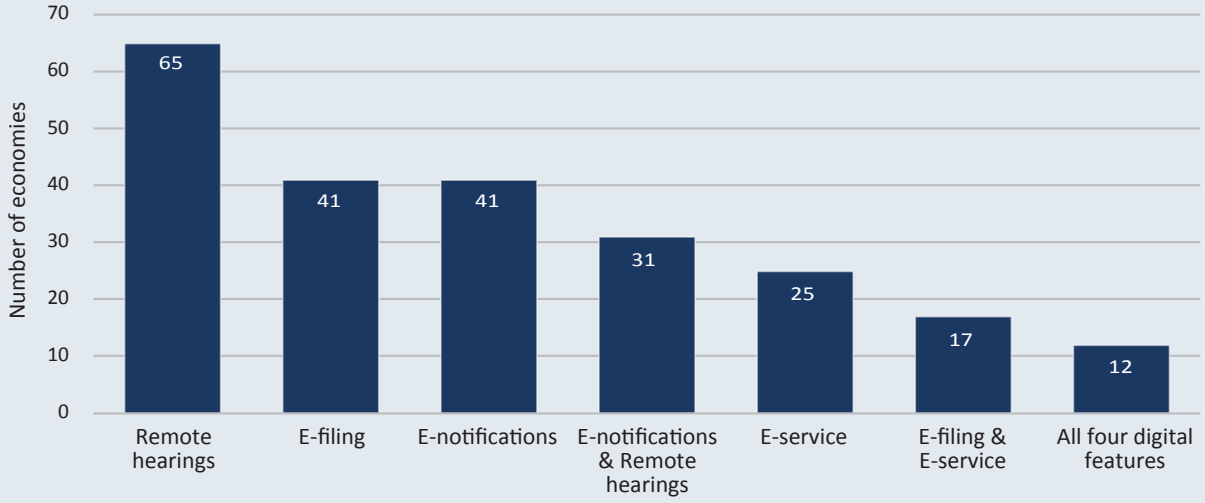
Source: World Bank, DECIG research data collected as of May 1, 2020, and May 1, 2021.
Note: The figure shows the percentage of economies within each income group that implemented at least one reform in the area of court digitization during the COVID-19 pandemic. The sample includes 120 economies. A reform is counted whenever an economy introduced for the first time any of the following features: electronic filing, electronic service of process, electronic notifications, or remote hearings.

The COVID-19 pandemic compelled policy makers and researchers to look at this subject from a new perspective: that is, how the digitization of courts can ensure uninterrupted delivery of justice during an emergency. The DECIG special data collection exercise in 2020–21 found that as of May 1, 2020, 81 out of 120 tracked economies had to interrupt judicial services due to public health safety measures. As suggested by some research, those jurisdictions that were from the very beginning better prepared in terms of court digitization were able to navigate through the lockdown periods and subsequent restrictions with fewer operational disruptions (Sourdin, Li, and McNamara 2020; Strauss and Bradautanu 2021). Other economies, however, had to quickly implement reforms to digitize their court systems. In less than two years, to ensure access to justice during the health crisis, 65 jurisdictions enabled remote hearings, 41 introduced electronic filing of documents, another 41 introduced electronic notifications, and 25 made it possible to serve documents electronically (Figure 2). Unsurprisingly, more reforms occurred in the areas that judiciaries prioritized less before the pandemic, such as electronic notifications and remote hearings (31 economies enabled both features), compared to the areas that had already received some recognition within courts (17 economies introduced both features for the first time). One year later, as of May 1, 2021, the number of economies experiencing interruptions of judicial services decreased to 16. It seems reasonable to assume that the rapidly increased level of court digitization contributed to this reduction.

Digitization of courts and transparency

It is widely recognized that transparency plays a crucial role in fostering trust in government institutions and tackling corruption (Kaufmann and Bellver 2005; World Bank 2017). Researchers

Figure 2 Economies adopted a variety of digital reforms during the COVID-19 pandemic to improve access to justice



Source: World Bank, DECIG research data collected as of May 1, 2020, and May 1, 2021.
Note: The sample includes 120 economies.

contend that electronic initiatives can increase the transparency of governments in general (Shim and Eom 2008), as well as of courts in particular (Ahmed et al. 2022). For instance, a study of the Brazilian judiciary found that digitization can bring judges and their work closer to the public, increasing openness within the court system (Filho 2009). An analysis of digitization efforts in the Malaysian judiciary showed that a special electronic software can ensure a more ordered and transparent interaction between court staff and lawyers (Hamin, Othman, and Mohamad 2012). In a research project conducted to evaluate the implementation of an e-court system in an appellate court in the region of Kurdistan in Iraq, the participants stated that the initiative enhanced transparency: specifically, that the new e-system promoted it by allowing users to track their cases, view hearings, and access court decisions online, and by ensuring automatic case assignment among judges (Ahmed et al. 2020). A review of a pilot project in Pakistan revealed that an electronic management system (ECMS) may further bolster transparency through integration of schemes to detect statistical anomalies that identify questionable cases within the judiciary (Rahman et al. 2014).

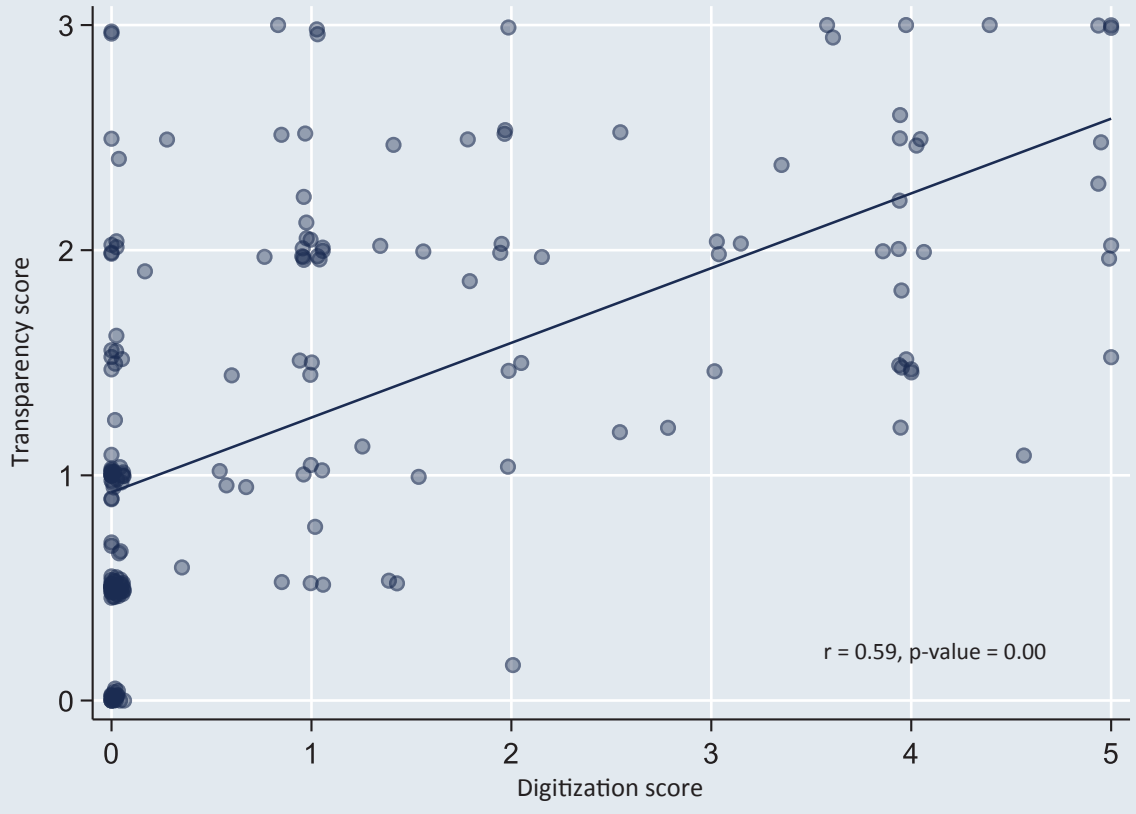
Existing studies on the effect of digitization on court transparency, in most cases, focus on only one jurisdiction, whether at the national or subnational level. A separate DECIG dataset, *Doing Business 2016–2020*, however, allows this relationship to be tested at the global scale. In particular, the *Doing Business 2016–2020* data make it possible to construct two indexes: one accounting for digitization of courts and the other measuring judicial transparency. The digitization index is composed of five *Doing Business* components: electronic filing, electronic service of process, electronic payment, ECMS for lawyers, and ECMS for judges; this index has a maximum score of 5. The transparency index aggregates three *Doing Business* components: case assignment among judges, release of performance measurement reports, and publication of commercial judgments across different levels of the judiciary; this index has a maximum score of 3.

The global panel data set covering five years shows that digitization of courts is indeed strongly and positively correlated with judicial transparency (Figure 3). That is, the judiciaries that are more advanced in terms of digital adoption also largely appear to be more transparent. This relationship can potentially be attributed to the fact that it is easier for courts to collect and publish the data about their activities once they have necessary ICT infrastructure. For example, unlike paper submissions, the electronic flow of documents typically allows courts to quickly amass information on the duration of proceedings. As a rule, the data are already present in the e-system. Accordingly, if judiciaries are willing to share such information with the public, they will not incur significant extra costs.

Digitization of courts and efficiency

Efficiency is critical in dispute resolution. A fundamental legal maxim posits that justice delayed is justice denied. Unreasonably lengthy court proceedings may subject litigants to endless uncertainty, deprive them of necessary financial resources, and ultimately create a feeling of distrust toward the judiciary. Several studies have found a correlation between advanced digitization and increased court efficiency. For instance, an overview of the implementation of ICT-related reforms in the High Courts in Malaysia showed that the measures taken simplified the administration of justice and increased judges' productivity (Hamin, Othman, and Mohamad 2012). A study of delays in

Figure 3 Digitization of courts is strongly and positively correlated with judicial transparency



Source: World Bank, DECIG research based on World Bank, *Doing Business 2016–2020.*
Note: The sample includes 191 economies. These results stand after running a partial regression plot controlling for the gross domestic product (GDP) per capita, an indicator of the World Bank's World Development Indicators database applied for the respective *Doing Business years.*

adjudicating cases in Italy suggested that new technologies could be used to expedite court proceedings (Cusatelli and Giacalone 2014). An analysis of the panel data that covered labor courts across different levels of the Brazilian judiciary concluded that investment in digitization has a direct and positive effect on the productivity of courts (Gomes, Alves, and Silva 2018). Furthermore, a study of the backlog of cases in the Kenyan Environment and Land Court found that the issue could be tackled through the uptake of artificial intelligence (Ogonjo et al. 2021).

Nonetheless, some other studies take a more cautious stance toward the relationship between digitization and efficiency. For example, an overview of ICT-related initiatives taken in Europe showed that often these measures have fallen short of the original expectations because their implementation had to content with a number of challenges, such as the need to identify the proper level of complexity, ensure adoption, and select the right infrastructure (Velicogna 2007). A different study of the impact of technology investment on court performance demonstrated that while ICT investment has a positive effect on productivity, its influence is modest (Louro, Santos, and Filho 2017). In addition, a study centered on tax enforcement matters in Brazilian courts found no significant difference in terms of duration between cases filed in a traditional manner and those submitted electronically (Procopiuck 2018).

To investigate efficiency, the *Doing Business 2016–2020* data were again used. In particular, the data allowed the DECIG analysis to calculate the time to resolve a standardized dispute in court (for which the time for the filing and adjudication phases was used) and to compare it with the digitization index. Contrary to some expectations, the results of the regression showed no strong correlation between a higher degree of judicial digitization and a faster dispute resolution process (Figure 4). Furthermore, while the relationship between the two variables is negative (which means that in economies with better levels of digital adoption resolving a dispute takes less time), it is also not statistically significant.

These findings, however, should not be interpreted as implying that digitization is not important for improving court efficiency. Rather, the results are a reminder that dispute resolution is a complex, multifaceted system, where reforms aimed at reducing proceedings' duration should take into account a variety of factors, not just digitization. As established in research, other factors that can also affect court efficiency include the demand for judicial services (Bełdowski, Dąbroś, and Wojciechowski 2020); the number of judges and assistants (Mitsopoulos and Pelagidis 2007); their specialization and expertise (Palumbo et al. 2013); leadership and culture (Gramckow and Ebeid 2016); and the quality of procedural legislation (Mitsopoulos and Pelagidis 2007); among others. To maximize the benefits of digital adoption in courts, it is therefore crucial to pursue a holistic approach when enhancing judicial efficiency. This involves supplementing the introduction of new technologies with other reform initiatives: namely, those that invest in court personnel, streamline procedural laws, arrange training activities for private practitioners, and so on.

Conclusion

Digitization has been occurring in many judicial systems for the past several decades, but the pace accelerated remarkably with the outbreak of the COVID-19 pandemic. The crisis prompted governments around the world to implement an unprecedented number of reforms to digitize their judiciaries. Nevertheless, this

Figure 4 No strong correlation was found between a higher degree of judicial digitization and a faster dispute resolution process

Source: World Bank, DECIG research based on World Bank, *Doing Business 2016–2020.*
Note: The sample includes 191 economies. These results hold after running a partial regression plot controlling for gross domestic product per capita, an indicator of the World Bank's World Development Indicators database applied for the respective Doing Business years. The relationship also remains relatively weak (r = - 0.16) after removing the apparent outlier from the sample, even though its significance improves (p-value = 0.03).

surge in digitization efforts also further widened the divide between developed and developing economies in terms of their capacities.

DECIG data suggest that higher levels of digitization can facilitate access to justice, specifically with respect to operation of courts in time of emergency. In addition, the data show that advancements in the adoption of new technologies by the judiciaries are strongly and positively correlated with increased court transparency. The relationship between digitization and judicial efficiency, however, was found to be relatively weak. Caution is warranted when anticipating the impact of digital adoption on the duration of court proceedings. Digitization is only one factor, albeit an important one, that can influence the time to resolve a dispute.

The recent COVID-19-related reforms aimed at judicial digitization often also expanded the existing capabilities of what can be done online in dispute resolution and introduced new features. Furthermore, as artificial intelligence penetrates deeper into business operations and public services, some judiciaries are already exploring how it can be used in their work (Reiling 2020). Against this background, there is a clear need for an updated and more comprehensive cross-country data set that would allow policy makers and researchers to track the impact of these developments on court accessibility, transparency, and efficiency. The upcoming Business Ready (B-READY) project of the World Bank Group is expected to fill this data gap. Continuous studies are essential to enrich the understanding of how economies can successfully leverage the increased digital adoption in courts.

References

Ahmed, Rozha K., Khder H. Muhammed, Aleksander Reitsakas, Ingrid Pappel, and Dirk Draheim. 2020. "Improving Court Efficiency through ICT Integration: Identifying Essential Areas of Improvement." doi: 10.1007/978-981-15-0630-7_44.

Ahmed, Rozha K., Omer Ahmed, Ingrid Pappel, Aleksander Reitsakas, and Dirk Draheim. 2022. "The Role of Digital Transformation in Fostering Transparency: An e-Court System Case Study." In *The Role of Digital Technologies in Shaping the Post-Pandemic World*, edited by S. Papagiannidis, E. Alamanos, S. Gupta, Y. K. Dwivedi, M. Mäntymäki, and I. O. Pappas. Lecture Notes in Computer Science, Vol 13454. Cham, Switzerland: Springer. https://doi.org/10.1007/978-3-031-15342-6_17.

Bełdowski, Jarosław, Łukasz Dąbroś, and Wiktor Wojciechowski. 2020. "Judges and Court Performance: A Case Study of District Commercial Courts in Poland." *European Journal of Law and Economics* 50: 171–201.

Bulinski, Maximilian A., and J. J. Prescott. 2016. "Online Case Resolution Systems: Enhancing Access, Fairness, Accuracy, and Efficiency." *Michigan Journal of Race & Law* 21 (1). https://repository.law.umich.edu/mjrl/vol21/iss2/4.

Cabral, James E., Abhijeet Chavan, Thomas M. Clarke, John Greacen, Bonnie Rose Hough, Linda Rexer, Jane Ribadeneyra, and Richard Zorza. 2012. "Using Technology to Enhance Access to Justice." *Harvard Journal of Law & Technology* 26 (1): 241–324.

CEPEJ (European Commission for the Efficiency of Justice). 2016. "Good Practice Guide: Structural Measures Adopted by Some Council of Europe Member States to Improve the Functioning of Civil and Administrative Justice. In Addition to the Effective Domestic Remedies Required by Article 13 of the ECHR." CEPEJ, Strasbourg.

Cusatelli, Carlo, and Massimiliano Giacalone. 2014. "Evaluation Indices of the Judicial System and ICT Developments in Civil Procedure." *Procedia Economics and Finance* 17: 113–120.

Egessa, Mathew M., and Regina Cherotich. 2017. "SMS Enhanced Justice: Towards Efficiency and Convenience in Court Cases." Proceedings of 1st Annual Innovation Research Symposium, March 2017, University of Nairobi, Nairobi, Kenya, 19–27.

Fabri, Marco. 2021. "Will COVID-19 Accelerate Implementation of ICT in Courts?" *International Journal for Court Administration* 12 (2). doi: 10.36745/ijca.384.

Filho, Roberto Fragale. 2009. "The Use of ICT in Brazilian Courts." *Electronic Journal of e-Government* 7 (4): 349–58.

Gomes, Adalmir Oliveira, Simone Tiêssa Alves, and Jéssica Traguetto Silva. 2018. "Effects of Investment in Information and Communication Technologies on Productivity of Courts in Brazil." *Government Information Quarterly* 35 (3): 480–90.

Gramckow, Heike, and Omniah Ebeid. 2016. "Establishing Small Claims Courts and the Impact on Service Delivery in the Justice System." *Just Development* Issue 9, February 2016, World Bank, Washington, DC.

Hamin, Zaiton, Mohd Bahrin Othman, and Ani Munirah Mohamad. 2012. "Benefits and Achievements of ICT Adoption by the High Courts of Malaysia." 2012 IEEE Symposium on Humanities, Science and Engineering Research, Kuala Lumpur, Malaysia, 1233–38.

Kaufmann, Daniel, and Ana Bellver. 2005. "Transparenting Transparency: Initial Empirics and Policy Applications." http://dx.doi.org/10.2139/ssrn.808664

Louro, Alamir Costa, Washington Romão Santos, and Helio Zanquetto Filho. 2017. "Productivity Antecedents of Brazilian Courts of Justice: Evidence from Justiça em Números." BAR–*Brazilian Administration Review* 14 (4): 1–18.

Mitsopoulos, Michael, and Theodore Pelagidis. 2007. "Does Staffing Affect the Time to Dispose Cases in Greek Courts?" *International Review of Law and Economics* 27 (2): 219–44.

OECD (Organisation for Economic Co-operation and Development). 2021. "Access to Justice and the COVID-19 Pandemic: Compendium of Country Practices." OECD Publishing, Paris.

Ogonjo, Florence, Joseph Theuri Gitonga, Dr. Angeline Wairegi, and Dr. Isaac Rutenberg. 2021. "Utilizing AI to Improve Efficiency of the Environment and Land Court in the Kenyan Judiciary: Leveraging AI Capabilities in Land Dispute Cases in the Kenyan Environmental and Land Court System." Proceedings of the Second International Workshop on AI and Intelligent Assistance for Legal Professionals in the Digital Workplace (LegalAIIA 2021), held in conjunction with ICAIL 2021, São Paulo, Brazil.

Palumbo, Giuliana, Giulia Giupponi, Luca Nunziata, and Juan S. Mora Sanguinetti. 2013. "The Economics of Civil Justice: New Cross-country Data and Empirics." OECD Economics Department Working Paper No. 1060, Organisation for Economic Co-operation and Development, Paris.

Prescott, J. J. 2017. "Improving Access to Justice in State Courts with Platform Technology." *Vanderbilt Law Review* 70 (6): 1993–2050.

Procopiuck, Mario. 2018. "Information Technology and Time of Judgment in Specialized Courts: What is the Impact of Changing from Physical to Electronic Processing?" *Government Information Quarterly* 35 (3): 491–501.

Rahman, Amn, Hassan Nawaz, Omer Naeem, Fareed Zaffar, Farooq Naseer, and Adeel Zaffar. 2014. "Finding Needle in the Case-stack: Effective Remote Monitoring of Courts." 47th Hawaii International Conference on System Science, Waikoloa, Hawaii, United States, 1906–15.

Reiling, A. D. (Dory). 2020. "Courts and Artificial Intelligence." *International Journal for Court Administration* 11(2). doi: 10.36745/ijca.343.

Schmitz, Amy J. 2018. "There's an App for That: Developing Online Dispute Resolution to Empower Economic Development." *Notre Dame Journal of Law, Ethics & Public Policy* 32 (1): 1–46.

Shim, Dong Chul, and Tae Ho Eom. 2008. "E-Government and Anti-Corruption: Empirical Analysis of International Data." *International Journal of Public Administration* 31 (3): 298–316.

Sourdin, Tania, Bin Li, and Donna Marie McNamara. 2020. "Court Innovations and Access to Justice in Times of Crisis." *Health Policy and Technology* 9 (4): 447–53.

Strauss, Michael, and Veronica Bradautanu. 2021. "Emerging Markets Embracing Online Courts–Commercial Courts for Small Value Claims." *Law in Transition Journal.*

Velicogna, Marco. 2007. "Justice Systems and ICT: What Can Be Learned from Europe?" *Utrecht Law Review* 3 (1): 129–47.

World Bank. 2017. World Development Report 2017: Governance and the Law. Washington, DC: World Bank.