

Capítulo XI
TOWARDS A HUMAN-CENTRIC FUTURE OF JUSTICE: INTEGRATING ODR, AI AND
INDUSTRY 5.0 IN LEGAL SYSTEMS

AMY SCHMITZ*

LUIS ALFONSO GÓMEZ**

COLIN RULE***

INTRODUCTION

The swift pace of technological evolution has heralded significant transformations, particularly in the legal sector, with the rise of Online Dispute Resolution (ODR) and the integration of Artificial Intelligence (AI). As we navigate towards the dawn of Industry 5.0, the imperative to meld human insight with the precision of machine

* Se destaca como abogada graduada *summa cum laude* de la University of Minnesota Law School y posee una licenciatura en Ciencias Políticas y Español de Drake University. Inició su carrera en el ámbito legal como asociada en firmas de renombre como Stoel Rives LLP y Faegre & Benson LLP, especializándose en derecho contractual, comercial y de arbitraje.

Actualmente, ocupa la cátedra John Deaver Drinko-Baker & Hostetler en The Ohio State Moritz College of Law y se desempeña como codirectora en el Translational Data Analytics Institute (TDAI) para la Ciencia de Datos Responsable, además de liderar el programa JusticeTech. Su experiencia profesional incluye puestos destacados en la University of Missouri y la University of Colorado, así como colaboraciones internacionales con instituciones y proyectos de ley.

Como académica, ha impartido una variedad de cursos sobre contratos, resolución de disputas, y el uso de la tecnología en el derecho. Es autora y coautora de numerosas publicaciones influyentes en el campo del Online Dispute Resolution (ODR), incluyendo obras galardonadas como *The New Handshake: Online Dispute Resolution and the Future of Consumer Protection*.

** Abogado egresado de la Universidad Externado de Colombia, Máster en Negocios Internacionales y Gerencia en la Universidad de Westminster, y especialista en Derecho Financiero de la Universidad del Rosario. Se ha desempeñado como asesor legal en la Procuraduría General de la Nación de Colombia y también ha brillado en el ámbito académico como docente investigador en la Universidad Externado, contribuyendo significativamente al campo del derecho con publicaciones en negociación y arbitraje internacional. Actualmente avanza en su doctorado en Tilburg University.

*** Vicepresidente de Resolución de Conflictos en Línea, CEO de ODR.com y Mediate.com, exdirector de Resolución de Conflictos en Línea para eBay y PayPal, y profesor de Derecho en la Facultad de Derecho de Stanford y en la Facultad de Derecho de la Universidad de Santa Clara.

efficiency grows ever more evident. This exploration seeks to unravel the synergies between ODR, AI, and the ethos of Industry 5.0, charting a path towards a future where legal systems not only benefit from technological advancements in terms of enhanced accessibility and effectiveness given by LLMs but also adhere steadfastly to principles centered around the human experience.

I. TECHNOLOGY IS CHANGING THE WAY HUMANS INTERACT

If you look around, it is hard to deny that technology is sparking major transformations in the way humans interact with each other. Thinking back, just two or three decades, our lives were very different than they are today. In the 20th century geographic limitations dictated almost entirely who we interacted with each day and what activities filled our daily lives. Now in the 21st century global networks enable us to interact with anyone anywhere in the world with just a few swipes of our fingers on the screen of a mobile phone. Technology has flattened the limitations of time and space, and we will never go back to the way it was before.

Using technology for communication is now commonplace in both our personal and professional lives. Millennials find it hard to imagine how people got anything done in the days before we could text, videoconference, or surf the internet. How did we find people at the airport? How did we figure out the latest conversion rate from pesos to dollars? It's getting hard to remember how we managed¹. Marc Andreessen, one of the inventors of the modern web browser, predicted that software was going to eat the world, and every day there is new evidence that his prediction is coming true².

One area that is being rapidly transformed is the way that people resolve disagreements and disputes. Most people use technology tools to complete the items on their to-do lists every day, so they now expect that they will also be able to

¹ David A. Larson, "Online Dispute Resolution: Do You Know Where Your Children Are?" *Negotiation Journal*, vol. 19, no. 3, 2003, at 199. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=945682

² Marc Andreessen, "Why Software is Eating the World," in *Andreessen Horowitz*, 20 Aug. 2011. <https://a16z.com/2011/08/20/why-software-is-eating-the-world/>

draw upon them to resolve any problems that they encounter. From minor annoyances with eCommerce purchases to parking tickets to restaurant reviews, technology is already making it easier to find solutions whenever a problem crops up. Now technology is being used to handle more complex emotional disputes, like workplace issues or divorce and custody cases, or higher value disputes, like civil or commercial matters. Just like finding people at the airport, we'll never go back to the way it was before.

This development represents a significant opportunity to expand access to justice. In the past many people did not bother to pursue redress for minor annoyances because they sensed that the resolution process would be more of a headache than a fair resolution was worth. But now that technology has made pursuing redress easier and more convenient, the calculation has changed, so more people are deciding that they want to pursue resolution. Some of this opportunity to expand access to justice exists within traditional resolution forums, like the courts, but new options are also arising within the private sector. All societies need to provide their citizens access to just means to resolve disputes, and as our society moves online, the opportunities to provide that access through technology are multiplying. Citizens now expect that they will be able to leverage technology to resolve disputes efficiently and effectively 24x7, because that's the level of responsiveness they already enjoy on websites like Amazon and Google.

But it's not only that technology is providing options to resolve the same kinds of problems that we have always experienced. Technology is also creating whole new categories of disputes we never experienced before. Previously, if we wanted to buy an item, we had to get into our car and drive down to a store to buy the item in person. Now we can buy an item from any seller anywhere in the world using the Internet, which makes the scope of potential disputes much more complicated. You can imagine if a buyer is in one country and a seller is in another country, and the marketplace that they are using to facilitate the transaction is in a third country, then trying to figure out what legal jurisdiction applies is a very complicated challenge. Existing judicial models for resolving problems are highly dependent on geographic location, because geographic location dictates the legal jurisdiction of the resolution

process. But the Internet blurs geographic location and makes jurisdiction much more complicated to figure out, which means the existing models do not work very well.

What we need is a justice system that works the way the Internet works. In the future, resolution processes should not be dependent on geographic location, because the Internet makes determining a precise location for each interaction almost impossible. We need to design a new justice system that works at the speed of technology, enabling fast and fair resolutions anywhere within the reach of the Internet.

A. The evolution of legal frameworks in tech-driven societies

Technology has transformed various professions, markedly evident in medicine and finance. In the 1950s, medical practice emphasized hands-on learning from experienced doctors without the involvement of advanced technologies. Today, however, tools such as X-rays, CT scans, ultrasounds, and laser and robotic surgeries are indispensable. This technological evolution would be baffling to a doctor from 1980 if they found themselves in a modern operating room. Similarly, the financial sector has undergone a comparable transformation. Previously, stock transactions were physically carried out on the floors of stock exchanges. Now, these operations are executed in milliseconds by computers, replacing traditional trading floors with server farms. This radical change would also astonish a stockbroker from 1980, demonstrating the profound impact of technology on the evolution of professions.

But even as technology has transformed those professional fields, the fields themselves did not go away. The introduction of technology increased the efficiency and effectiveness of those fields, but it did not replace humans — it just changed their role. Now there are even more people employed in the fields of medicine and finance than there were before technology was introduced at scale, but people are managing the technology instead of handling all the tasks by hand.

This kind of transformation is now coming to the law. The law has not changed as much as medicine and finance over the last 50 years. Technology has encroached around the edges of legal practice in areas like electronic filing, research, and case management, but the actual courtroom process still looks very similar to what it looked like back in 1980. A lawyer plucked from 70 years ago and dropped into a modern courtroom could probably still do an adequate job. Part of the slow speed of change is a result of the legal monopoly. Bar associations have the exclusive authority to train and certify new lawyers, which enables them to have an unprecedented amount of control over the overall legal field. This has enabled the law to be more successful in fending off technological disruption. However, this control now appears to be coming to an end. Technology is starting to disrupt the law.

These changes are not being driven primarily by lawyers, bar associations, judges, or court administrators. They are being pushed most significantly by the disputants and litigants themselves. Because citizens utilize technology in almost every area of their lives, they now expect that when they encounter a dispute or file a lawsuit they will have access to similar kinds of tools to help them manage that process. Also, the long delays that are routine in the judicial system are out of sync with the fast pace of life in our newly digitized society. Disputants now demand faster, cheaper, and more efficient resolution processes that deliver outcomes in days or weeks instead of months or years. They're no longer willing to pay large retainers and be billed by the hour to resolve their cases over a long period of time. And technology is giving them the means to push for the kinds of changes they want.

B. Challenges facing the legal system

In addition to this pressure from clients, the legal system is also suffering from several crises that are accelerating the move towards digitization. One is a very high rate of Self-Represented Litigants, or SRLs. Many of the people who come to the

court system these days cannot afford representation from a competent attorney³. These individuals elect to self-represent even though they do not have any legal training.

The court system was designed to be navigated by individuals who understand its complex processes and specialized language. It is not immediately apparent to SRLs what steps they need to take or what documents need to be filed at each stage of the judicial process. When SRLs come into the court and start asking questions about what they should do in their legal case, court administrative staff and legal librarians are often reluctant to give them too much information or assistance for fear that they will be accused of providing legal services without having the appropriate qualifications to do so. SRLs also get on average much worse outcomes than litigants who are represented by attorneys⁴. Many courts report that 50 to 60 % of the new cases are coming from SRLs, which creates frustration on the part of the litigant and administrative costs for the court in handling those cases⁵.

Many court systems are also seeing their budgets cut by state legislatures. Politicians are tasked with balancing many competing priorities when they make budget decisions, and when resources are tight the funds allocated to the courts are increasingly being reallocated to matters considered more pressing. In the state of California more than \$ 600 million has been cut out of court budgets over the last 10 years, which has forced courts to reduce services and eliminate many administrative positions, which compounds the dissatisfaction felt by citizens

³ Charles Dyer, "Self-Represented Litigants: A Guide for Government and Court Decision Makers," *GLL Resource Guide*, no. 4, 2018. <https://www.aallnet.org/gllsis/wp-content/uploads/sites/9/2018/01/scilguide4.pdf>

⁴ Lauren Lucas and Darcy Meals, "Every year, millions try to navigate US courts without a lawyer," in *The Conversation*, 22 Sept. 2017. <http://theconversation.com/every-year-millions-try-to-navigate-us-courts-without-a-lawyer-84159>

⁵ Natalie Knowlton *et al.*, *Cases Without Counsel*, IAALS Research Report, May 2016. https://iaals.du.edu/sites/default/files/documents/publications/cases_without_counsel_research_report.pdf. See also National Center for State Courts Self Representation Resource Guide, <https://www.ncsc.org/Topics/Access-and-Fairness/Self-Representation/Resource-Guide.aspx>

6.

Many law schools are reporting that it is harder for recent graduates to find paying positions in the law than it was 10 or 20 years ago⁷. In order to save costs, some law firms have outsourced their entry-level work to less expensive employees and contractors in other parts of the world⁸. Many recent law school grads, unable to find employment doing legal work, transition to working in other industries soon after graduation. Leaders in the legal community argue if there are so many young lawyers looking for work, and there are so many SRLs looking for representation, why can't we just connect these two groups to make the overall system work more effectively? But the challenge is that lawyers, even lawyers who are early in their practice, are still more expensive than what many SRLs can afford to pay. It is no longer true that access to justice is synonymous with access to lawyers. We need to find new ways to help litigants get access to just resolution processes so they can work out their problems quickly and definitively, and the solution isn't going back to the way things worked before the Internet.

C. The expansion of dispute resolution

These challenges around access to justice are not new. In the 1970s a grassroots movement arose in the United States to expand access to fast and fair resolutions for citizens. It was called Alternative Dispute Resolution, or ADR. Growing out of decades of work in the labor-management field around resolving labor disputes, activists introduced ADR to provide fair resolutions to low value disputes outside of the courthouse

⁶ Leanne Kozak, "Judicial Branch Budget Cuts," in *California Courts News*, 26 July 2011. <https://www.courts.ca.gov/14876.htm>

⁷ Jack Miller, "Law Schools Face Diminished Enrollment Numbers," in *The Heights*, 10 Feb. 2019. <https://bcheights.com/2019/02/10/law-schools-face-diminished-enrollment-numbers/>

⁸ Sally Kane, "Top Advantages of Legal Process Outsourcing (LPO)," in *LiveAbout*, 20 Nov. 2019. <https://www.thebalancecareers.com/top-advantages-of-outsourcing-2164339>.

⁹. The ADR movement grew and matured over the next few decades, transforming the justice system and expanding into other kinds of disputes.

In 1977 a Harvard Law School professor named Frank Sander gave a speech on expanding access to justice where he described a new vision for a “multidoor courthouse” offering a variety of appropriate resolution pathways for individual dispute types¹⁰. When a potential litigant came up to this new multidoor courthouse, instead of being ushered directly in front of a judge, they would be asked what kind of dispute they were experiencing. If they said they had a family dispute, for example, they would be directed to a process (“door #1”) specifically designed for family cases. If they indicated they were experiencing an intellectual property dispute, they could be pointed toward a different process (“door #5”) specifically crafted for intellectual property matters.

This vision of a courthouse with multiple pathways to justice was a radical concept at the time, but the wisdom of Prof. Sander’s recommended approach quickly gained traction, and it transformed the provision of justice in the United States over the next few decades. Prof. Sander’s idea of “fitting the forum to the fuss”¹¹ (as he put it) freed judicial dispute systems designers to think about what process designs would best meet the needs of each individual case type instead of designing a one-size-fits-all courthouse. For instance, over the next few decades, the family courts embraced the concept of mediation as a better way to resolve custody and separation cases than the traditional litigation model, and now mediation has a mandatory component of family courts across the United States.

⁹ Terry Amsler, “Community Dispute Resolution: Assessing Its Importance and Addressing Its Challenges,” in *Dispute Resolution Magazine*, vol. 19, no. 2, 2013, pp. 4-6. <https://www.yumpu.com/en/document/read/21987413/winter-2013-dispute-resolution-magazine-american-bar-association>

¹⁰ Michael Moffitt, “Before the Big Bang: The Making of an ADR Pioneer,” in *Negotiation Journal*, vol. 22, no. 4, 2006, pp. 437-443. <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1571-9979.2006.00112.x>

¹¹ Frank E. A. Sander and Stephen B. Goldberg, “Fitting the Forum to the Fuss: A User-Friendly Guide to Selecting an ADR Procedure,” in *Negotiation Journal*, vol. 10, no. 1, 1994, pp. 49-68. <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1571-9979.1994.tb00005.x>

II. MARRYING TECHNOLOGY AND DISPUTE RESOLUTION

Online Dispute Resolution (ODR) arose in the late 1990s as an outgrowth of ADR. It focuses on how to best use information and communication technology to help disputants resolve their disputes¹². Initially ODR was designed to resolve disputes that arose online between two strangers who probably would never meet face-to-face. eCommerce marketplaces like eBay realized they needed to provide a fast and fair way for their users to resolve disputes in order to encourage people to trust online purchases¹³. Companies like eBay and Amazon and payment providers like PayPal invested tens of millions of dollars into the design and launch of ODR systems that could efficiently scale to handle many millions of disputes. By 2010 eCommerce companies were resolving tens of millions of these kinds of cases each year with ODR software¹⁴.

ODR initially grew out of eCommerce, but it was a short hop from online consumer issues to face-to-face consumer issues. Also, disputes did not only arise in online purchases of tangible goods; disputes also arose in online purchases of services. Any online marketplace experiences a high volume of disputes, from ridesharing companies like Uber to housing sharing companies like Airbnb. Online services marketplaces like TaskRabbit and Upwork also experience disputes. Each of these technology companies built their own ODR system for resolving problems that arose, and that led to a wave of innovation in the ODR space. But off-line companies also realized they needed efficient ways to resolve problems if they

¹² Ethan Katsh and Janet Rifkin, *Online Dispute Resolution: Resolving Conflicts in Cyberspace*, Jossey-Bass, San Francisco, 2001.

¹³ Noam Ebner, "ODR and Interpersonal Trust," in *Online Dispute Resolution: Theory and Practice: A Treatise on Technology and Dispute Resolution*, ed. by Daniel Rainey, Ethan Katsh and Mohamed Abdel Wahab, Eleven International Publishers, 2012.

¹⁴ Amy Schmitz, "Building Trust in eCommerce Through Online Dispute Resolution," in *Research Handbook on Electronic Commerce Law*, ed. by John A. Rothchild, Edward Elgar, 2016, U. of Colorado Law Legal Studies Research Paper no. 15-15. <https://lawweb.colorado.edu/profiles/pubpdfs/schmitz/SchmitzBuildingTrustinEcommerceThroughOnlineDisputeResolution.pdf>

wanted to improve customer loyalty, so they started utilizing ODR for their case volumes as well.

eBay built a piece of software called the *Resolution Center* which enabled individual users to report any problems they encountered and to track each individual case all the way through to resolution¹⁵. This worked very well inside the “walled garden” of eBay and PayPal, because there was complete visibility into all of the transactions in the marketplace as well as absolute enforcement ability in moving money from one user to another appropriate to any outcome achieved in the ODR process. But it was clear that many other case volumes outside of eBay’s walled garden could also benefit from a Resolution Center, so in 2011 eBay spun out the Resolution Center software so it could be applied to other case volumes. One of the early applications was property tax assessment appeals. When a local tax assessor notifies a taxpayer of the assessed value of their property and the tax owed for that property, the taxpayer has a legal right to appeal the valuation in order to lower their tax bill¹⁶. Resolution Centers very similar to the one built on eBay made this process more discoverable, efficient, and convenient.

Another area that proved to be a great fit with ODR was insurance cases. Sometimes there are disagreements between a medical service provider and an insurance company about how much money should be reimbursed for a treatment received by a policy holder. Resolution Centers enabled medical service providers and insurance companies to quickly negotiate and resolve these disagreements to keep these insurance reimbursement matters out of the courthouse. When these cases went into a court they would often take 3 to 5 years to be resolved, but when they were handled through ODR, they were resolved in an average of 3 to 5 months

¹⁵ Colin Rule, “Making Peace on eBay: Resolving Disputes in the World’s Largest Marketplace,” in *ACResolution Magazine*, Fall 2008. <http://colinrule.com/writing/acr2008.pdf>

¹⁶ Colin Rule and Mark Wilson, “Online Resolution and Citizen Empowerment: Property Tax Appeals in North America.” In *Revolutionizing the Interaction between State and Citizens through Digital Communications*, ed. by Sam B. Edwards III and Diogo Santos, Information Resources Management Association, 2015. <http://www.colinrule.com/writing/assessments.pdf>

A. Developing international first

The ADR movement arose on a grassroots level, as activists set up community mediation centers in individual neighborhoods to facilitate conversations between neighbors. ADR grew from neighborhood centers into the courthouses and eventually into higher value commercial cases. The rollout of ODR happened in the opposite direction. ODR arose on the international level first and then was adopted down into each country. These high volumes of low value cross-border disputes within marketplaces like eBay and Amazon were so out of sync with the court system that they required a new resolution process specifically built to resolve them. Technology companies pushed the creation and evolution of ODR because they needed to have a justice system for their users, because the existing justice system couldn't work for those cases. The private sector rapidly innovated around ODR in order to solve this problem.

International organizations eventually took the cue from the technology companies and led the push for the expansion of ODR. UNCITRAL, the UN agency responsible for harmonizing global laws, created a working group on ODR in 2010 that convened representatives from more than 66 countries to discuss how online dispute resolution could be utilized to provide fast and efficient redress in cross-border consumer matters. The European Parliament passed a regulation in 2015 that required all professional sellers to inform their buyers about ODR. Now the International Standards Organization (ISO) is leading an effort to make ODR available for all global eCommerce purchases. ODR is now the default resolution process for global eCommerce, but widespread adoption within individual countries is in development.

¹⁷ PR Newswire, "American Arbitration Association Selects Modria to Power New York No Fault Caseload," 5 Mar. 2014, <https://www.prnewswire.com/news-releases/american-arbitration-association-selects-modria-to-power-new-york-no-fault-caseload-248543191.html>

B. ODR makes its way into the courts

In retrospect, it was probably inevitable that ODR would eventually make its way into the court system. Just like the quote from the criminal who says he robs banks because “that’s where the money is,”¹⁸ in the United States, most intractable disputes eventually find their way into the court system. Unlike the eCommerce marketplaces that first pioneered ODR, courts are not subject to competition. Courts are invested with unique authority to decide cases and enforce outcomes even if one of the parties does not agree to participate. This monopoly on enforcement means that if an individual litigant wants to get their outcome enforced against the will of the counterparty, they really have no choice other than to resort to the court process. That also means that the courts do not have much of an incentive to evolve and refine their processes to prevent their customers from jumping ship and going somewhere else. Because the courts are the only game in town, there is no “somewhere else.” Courts are not subject to the same kinds of competitive pressures that incentivize private companies to rapidly evolve and innovate¹⁹.

But the younger generation is not willing to participate in processes that require in person attendance, the filing of paper forms, and delays over months or years. Many off-line systems that have worked efficiently for decades have been disrupted by millennials using technology to build a new system that they feel more effectively meets their needs (for example, the taxi associations being challenged by ridesharing companies like Uber and Lyft)²⁰.

¹⁸ Quoteresearch, “Exploring the supposed quote from Willie Sutton,” in *Quote Investigator*, 10 Feb. 2013. <https://quoteinvestigator.com/2013/02/10/where-money-is/> (Accessed 7 July 2019).

¹⁹ Laurel Rigertas, “The Legal Profession’s Monopoly: Failing to Protect Consumers,” in *Fordham Law Review*, vol. 82, 2014. http://fordhamlawreview.org/wp-content/uploads/assets/pdfs/Vol_82/No_6/Rigertas_May.pdf

²⁰ Jim Edwards, “Uber Is Destroying the Value of Taxi Monopolies in a Bunch of American Cities,” in *Business Insider*, 28 Nov. 2014. <https://www.businessinsider.com/uber-destroying-value-of-taxi-monopolies-cartels-2014-11>

The monopoly enjoyed by the courts created a risk that the courts would become complacent, so they would not effectively innovate and update their systems to keep up with evolving user expectations. As evidence of that trend, over the past decade courts have seen their filing volumes slowly decline even though the volume of commercial and consumer transactions in society, powered by technology, has grown steadily²¹. This has led some leaders within the courts to be concerned that they are slipping into a “spiral of irrelevance” where the disconnect between the solutions they offer and the expectations of citizens steadily drive cases away from the courts and into other newly available forms of redress being developed in the private sector.

The successes in launching and scaling ODR demonstrated how technology might help to modernize the courts. Almost 90 % of adult US citizens access the Internet²². It used to be that the only people that had access to the Internet were high income people, because accessing the Internet required expensive broadband connections and expensive laptops or computers. But now the explosion of low-cost mobile technology combined with cheap access to the Internet through cellular networks has made cost-effective access to online services much more common. Learning from ODR, legal service providers and courts realized that they could leverage the Internet and mobile technology to significantly expand access to justice for people at every level of income and education. Software could help parties understand their options, eventually directing them into appropriate channels to achieve a fair resolution for each individual case, like a digital version of Prof. Sander’s multidoor courthouse. Leaders in the legal service space began explicitly citing the traction achieved by global eCommerce ODR systems as a blueprint for the future of civil justice.

²¹ Matthew Hector, “Declining Court Caseloads Reflect Societal, Other Changes”, in *Illinois Bar Journal*, vol. 104, no. 3, Mar. 2016. <https://www.isba.org/ibj/2016/03/lawpulse/decliningcourtcaseloadsreflectsocio>

²² Monica Anderson, Andrew Perrin, Jingjing Jiang and Madhumitha Kumar, “10 % of Americans don’t use the internet. Who are they?,” in *Pew Research Center Fact Tank*, 22 Apr. 2019. <https://www.pewresearch.org/fact-tank/2019/04/22/some-americans-dont-use-the-internet-who-are-they/>

C. Global leadership leading to traction in the U.S. Courts

Courts in the United States were slower to realize this potential than courts in some other parts of the world. Countries like Singapore and the Netherlands demonstrated an early willingness to experiment with ODR technology in the early 2000s, and in 2014 an advisory committee in the United Kingdom called on the Ministry of Justice to create a new all-online court built on ODR to resolve low value civil cases²³. China has invested in the creation of several Internet courts which leverage cutting-edge technology to streamline the court process, resolve cases over video-based hearings, identify users with facial recognition, and optimize resolutions via mutual agreement through ODR²⁴.

Up until 2015 most of the innovations in court technology were taking place outside of the United States, but around 2016 leading thinkers in access to justice started to pay more attention to online dispute resolution, and several high profile pilots finally brought ODR into the US courts. In 2017 the Pew Charitable Trusts announced that they would spend more than \$ 100 million to promote the expansion of access to justice using technology, with ODR featuring prominently in their plans²⁵. The National Center for State Courts (NCSC) similarly began a series of efforts to document best practices in ODR for the courts and to consult with various court jurisdictions around the country on the design and deployment of ODR systems

²³ Graham Ross, "Final Report of the UK CJC ODR Committee", in *The National Centre for Technology & Dispute Resolution*, 7 Dec. 2018. <http://odr.info/cjc/>

²⁴ Sara Xia, "China's Internet Courts are Spreading; Online Dispute Resolution is Working," in *China Law Blog*, 23 Dec. 2018. <https://www.chinalawblog.com/2018/12/chinas-internet-courts-are-spreading-online-dispute-resolution-is-working.html>

²⁵ The Pew Charitable Trusts, "Online Dispute Resolution Offers a New Way to Access Local Courts," in *Pew Trusts Fact Sheet*, 4 Jan. 2019. <https://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2019/01/online-dispute-resolution-offers-a-new-way-to-access-local-courts>

²⁶. This led to a flowering of ODR within the United States courts. By the end of 2019 more than 50 courts in the United States had deployed online dispute resolution in one or more of their caseloads, and that number is predicted to double again by the end of 2020^[27].

Some courts built ODR processes with pre-existing software, such as the Modria platform from Tyler technologies²⁸ or the Matterhorn platform from Court Innovations²⁹. Other courts decided to build their own technology from scratch, such as the Utah State Judiciary³⁰. Some ODR programs targeted transactional case volumes like debt collection or small claims, while others targeted more emotional or relational disputes like family divorce and separation or workplace matters. In 2019 Pew and NCSC selected three teams of academics to conduct longitudinal studies of several of these court ODR programs to determine not only the satisfaction experienced by participants but also the durability and fairness of outcomes achieved over the longer-term

²⁶ The National Centre for Technology & Dispute Resolution, “NCSC/Pew Charitable Trusts ODR Project Announcement,” 10 July 2018. <http://odr.info/ncscpew-charitable-trusts-odr-project-announcement/>

²⁷ National Center for State Courts. *JTC Resource Bulletin. ODR for Courts* (version 2.0), 29 Nov. 2017. https://www.ncsc.org/__data/assets/pdf_file/0033/39579/JTC-Resource-Bulletin-Case-Studies.pdf

²⁸ Tyler Technologies, “Modria.” <https://www.tylertech.com/products/modria> (Accessed 7 Nov. 2019)

²⁹ Matterhorn, “Online Dispute Resolution (ODR).” <https://getmatterhorn.com/> (Accessed 7 Nov. 2019).

³⁰ Deno Himonas, “Utah’s Online Dispute Resolution Program,” in *Dickinson Law Review*, vol. 122, Iss. 3, 2018. <https://ideas.dickinsonlaw.psu.edu/dlr/vol122/iss3/6/>

³¹. This set the stage for even faster growth once the benefits of ODR were quantified through empirical research.

D. Overview of how ODR works

Most court ODR processes are designed to be a simple problem-to-solution workflow. When a complainant initiates the ODR process, the software asks what kind of problem they are experiencing and offers a menu of common problem types. The complainant then selects the type of problem they are experiencing from the menu. If an option describing their specific problem is not available in the menu, they can click “other” and then detail their situation (and later the system administrator can add that option to the menu so future users are given the ability to select it). Once the complainant has selected the type of problem that they are experiencing, they are given a list of some common solutions to that specific problem, and then they are asked which of these solutions would be acceptable to them. The user may pick several of the offered solutions that are acceptable, and they can also customize those solutions around their preferences. The complainant then is also given an opportunity to provide whatever evidence or information they would like to help bolster the case for the solution that they are requesting.

The respondent is then contacted and informed about the problem reported by the complainant and the solutions proposed. The respondent then has an opportunity to indicate if any of the proposed solutions would be acceptable to them, and they also have an opportunity to customize those solutions into a counterproposal. This technology-facilitated negotiation can help parties quickly define the specific problem that they are dealing with and generate several promising candidate solutions to resolve that problem. It can also help to avoid some of the more confrontational strategies that parties may utilize to create leverage that they can use to push the other side to accept their desired solution.

³¹ The Pew Charitable Trusts, “Online Dispute Resolution Moves from E-Commerce to the Courts,” in *Pew Charitable Trusts*, 4 June 2019. <https://www.pewtrusts.org/en/research-and-analysis/articles/2019/06/04/online-dispute-resolution-moves-from-e-commerce-to-the-courts>

E. The fourth party

One of the key concepts in the ODR field is the concept of the *fourth party*. First named by Janet Rifkin and Ethan Katsh in their seminal book *Online Dispute Resolution*³², the fourth party is a metaphor that gives technology a seat at the table alongside the other parties: party one and party two (the disputants in an individual case), and party three (the human neutral, either an arbitrator or a mediator). The *fourth party* is a way to conceptualize the role of technology in assisting the resolution of a case by giving ODR a seat at the table alongside the human parties. (You may picture it as a friendly looking robot if you like, but it could just as easily be a disembodied service running in the cloud.)

At present, the fourth party may only be capable of some very simple tasks, such as sending out reminder messages about upcoming deadlines or recording communications between participants. But technology is expanding its capabilities all the time, and the question is not so much what the fourth party is capable of today so much as what the fourth party may be capable of in the years to come.

Moore's Law, first proposed in the 1970s, posited that computer processors would double in power about every 18 months³³. This prediction has proven remarkably prescient, holding true to the current day (even though the timeline has now expanded to about two years). The futurist Ray Kurzweil has described an event called the Singularity which will occur when the power of a single computer processor exceeds the computing power of the human brain, and he predicts it to occur sometime before the year 2030^[34]. Combined with the predictions in Moore's law, that means that by the 2030s a single computer processor will be twice as

³² Ethan Katsh and Janet Rifkin, *Online Dispute Resolution: Resolving Conflicts in Cyberspace*, *op. cit.*

³³ Carla Tardi, "Moore's Law," in *Investopedia.com*, 5 Sep. 2019. <https://www.investopedia.com/terms/m/mooreslaw.asp>

³⁴ For an overview, see https://en.wikipedia.org/wiki/Technological_singularity (Accessed 7 Nov. 2019), as well as Ray Kurzweil's book, *The Singularity is Near*, 2005.

powerful as the human brain, and so on as computer processors expand in power at an exponential rate.

Computer scientists and artificial intelligence researchers have predicted for decades that computers might become so powerful one day that they would be able to approximate or exceed human intelligence. Now we are starting to see some of those prognostications coming true. Machine learning enables powerful computer processors connected to large, structured data sets to glean sophisticated rules that can be applied in future cases to make highly accurate decisions and determinations. Once we start to think about the role of technology as a fourth party in our disputes, we can envision a future where the expanding capabilities of the fourth party become indispensable in helping the human parties find fair and just outcomes to their cases with the assistance of technology.

F. What we still need to learn about ODR

There are many lessons and best practices we have learned about online dispute resolution over the past two decades, but there are still many questions we have yet to answer³⁵. Data generated by online dispute resolution platforms demonstrates clearly that ODR can be efficient, effective, consistent, and scalable. Data also demonstrates that ODR systems can generate very high levels of participant satisfaction through faster time to resolution and ease of access³⁶.

However, we still do not have definitive data on the durability of outcomes achieved through online dispute resolution and the rates of breakdown in outcomes achieved via ODR versus the rates of breakdown in face-to-face resolutions. Valid

³⁵ Ethan Katsh and Colin Rule, "What We Know and Need to Know About Online Dispute Resolution," in *South Carolina Law Review*, vol. 67, Iss. 2, article 10, 2016. https://www.americanbar.org/content/dam/aba/images/office_president/katsh_rule_whitepaper.pdf

³⁶ *Ibid.*

concerns have been raised about whether online dispute resolution techniques appropriately account for the emotional and psychological needs of the disputants³⁷. It stands to reason that in some emotionally complex cases the value of a human neutral listening to the stories of the parties and expressing empathy may exceed whatever efficiency benefits may come from a technology-only algorithmic resolution process.

There is also the question of whether ODR processes deliver the same quality of justice as face-to-face resolution systems. While a dispute systems design may be evaluated as procedurally independent of any individual case, the outcomes generated by these online processes should be evaluated against outcomes generated by face-to-face processes to understand how online mechanisms may change the nature of resolutions achieved³⁸. Especially once machine learning and artificial intelligence become more integrated into online dispute resolution systems outcome, measurement will be more important because the internal workings of an artificially intelligent algorithm may be too complicated for humans to evaluate for procedural justice³⁹.

Every ODR process should be subject to continuous monitoring, evaluation, and improvement to ensure the mechanism is operating ethically and as intended. External auditing and supervision may provide an additional layer of credibility and trustworthiness to the process as well. Online dispute resolution systems cannot be designed launched and then left to operate unsupervised; they must be continuously improved and observed so that they can adapt appropriately as case volumes and party expectations evolve.

³⁷ Jean R. Sternlight, "Pouring a Little Psychological Cold Water on ODR," in *Journal of Dispute Resolution*, no. 1, 2020. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3446140

³⁸ Robert J. Condlin, "Online Dispute Resolution: Stinky, Repugnant, or Drab," in *Cardozo Journal of Conflict Resolution*, vol. 18, 2017, pp. 717-758. https://digitalcommons.law.umaryland.edu/cgi/viewcontent.cgi?article=2580&context=fac_publications

³⁹ David Allen Larson, "Artificial Intelligence: Robots, Avatars, and the Demise of the Human Mediator," in *Ohio State Journal on Dispute Resolution*, vol. 25, no. 1, 2010, pp. 105-163. <https://open.mitchellhamline.edu/cgi/viewcontent.cgi?article=1352&context=facsch>

III. SMART CONTRACT, BLOCKCHAIN AND ODR

A. The rise of smart contracts

ODR is growing and expanding, as the commercial and legal worlds are increasingly reliant on technology⁴⁰. This is even more acute after the world closure during the pandemic of Covid-19, with all processes moved online due to health concerns. Business partners no longer rely on physical handshakes and inked documents. In fact, technology is revolutionizing the art of deal-making⁴¹. We now expect to make most purchases online through e-contracts, sealed with a click on the “accept” button⁴². Even corporate leaders now use e-mails and texts to negotiate deals, which they eventually “sign” online through services like DocuSign⁴³.

Despite our current comfort with these new types of “e-contracts”, “smart contracts” on the blockchain push the technology much further – and are not necessarily contracts of smart. Smart contracts are different from common e-contracts in that they are computer code creating an enforcement⁴⁴. E-contracts such as those we all accept in making common purchases online are still contracts with readable offer, acceptance and consideration. In contrast, those with no coding background cannot easily interpret a smart contract in its rawest form

⁴⁰ See generally, Richard Susskind, *Tomorrow's Lawyers: An Introduction to Your Future*, Oxford University Press, 2013.

⁴¹ Amy J. Schmitz and Colin Rule, *The New Handshake: Online Dispute Resolution and the Future of Consumer Protection*, At lx, 2017.

⁴² *Ibid.*

⁴³ iDatalabs, “Companies Using Verisign,” 2017. <https://idatalabs.com/tech/products/verisign>

⁴⁴ David Zaslowsky, “What to Expect When Litigating Smart Contract Disputes,” en *Law360*, 4 Apr. 2018. <https://www.law360.com/articles/1028009/what-to-expect-when-litigating-smart-contract-disputes>

⁴⁵. Again, it is simply computer code.

Smart contracts are made up of “nodes” which consist of computer coded algorithms that live in a decentralized ledger⁴⁶. A decentralized ledger, such as blockchain or Ethereum, is a computer-coded ledger spread throughout computers instead of being centralized in one computer or database⁴⁷. This decentralization helps make smart contracts nearly unhackable. Furthermore, these decentralized ledgers are immutable, meaning that the code generally cannot be altered. In other words, most distributed ledgers are “append only,” such that that parties may add to, but not alter or delete, information placed in the ledger.

This immutability and decentralization foster data safety. Accordingly, companies place data in the blockchain or another distributed ledger in order to manage risk. Furthermore, blockchain-based smart contracts create efficiencies and resolve transactional trust issues. The idea is that smart contracts may largely eliminate the need for complicated and costly letters of credit, bonds, and security agreements by digitizing automatic enforcement or payment in immutable computer code. At core, smart contracts codify if-then actions that may mimic contracts if built on a prior agreement, or they could simply carry out payment or enforcement based on objectively delineated facts⁴⁸. For example, code could be created to execute the following if-then actions: “If it rains, X gets an umbrella,” or “If the goods reach port A, B gets paid.”

⁴⁵ *Ibid.*

⁴⁶ Jakub J. Szczerbowski, “Place of Smart Contracts in Civil Law. A Few Comments on Form and Interpretation,” *Proceedings of the 12th Annual International Scientific Conference New Trends 2017*, 9 Jan. 2018. <https://ssrn.com/abstract=3095933>

⁴⁷ For a simple explanation of smart contracts, see Adil Haris, “Smart Contracts – A Simple yet Comprehensive Explanation in Pictures,” in *Hackernoon*, 23 Mar. 2019. <https://hackernoon.com/smart-contracts-a-simple-yet-comprehensive-explanation-in-pictures-bc21c7ab89b6>

⁴⁸ See Amy J. Schmitz and Colin Rule, “Online Dispute Resolution for Smart Contracts,” in *Journal of Dispute Resolution*, vol. 2019, Iss. 2, 2019, pp. 103-125; YouTube, Blockchain, Smart Contracts, and ODR – from Cyberweek, 2019.

The problem is that no amount of computer code can eliminate conflicts. An oracle, or third-party fact verification system, could incorrectly detect rain, code may be flawed, there may be disputes about what qualifies as “rain” (mist, fog, sleet), etc. Furthermore, parties may fight about delivery of defective goods, leaving parties with no choice but to attempt litigation to recoup losses⁴⁹. Aside from resetting – i.e., shutting down – the whole “if/then” system, these kinds of disputes present a challenge for immutable blockchain architectures⁵⁰. Accordingly, parties are wise to plan ahead and build arbitration into their smart contracts, in order to have a dispute resolution plan should smart contracts go awry. This chapter unpacks related issues and suggests a “plan.”

B. The role of the blockchain in smart contracts

One of the key technologies behind smart contracts is the blockchain, or another digital ledger. This is a digital distributed database, with data spread across the internet on various computers. It allows for information to be entered into the system and stored in different, redundant locations throughout the world. When a document is put into the blockchain, it is replicated across every archival node, keeping data available even if half of the nodes, or computers, go down. Imagine if you had a daily planner where everything you wrote in the planner would be duplicated exactly in other planners around the world, and each replication would include new information that is added. Even if you lost one planner, the information would still be preserved in the replications.

Also, imagine if there were safety “rules” around what information can be added to this planner. If someone tried to write something in the planner that did not follow the rules, then all the other planners would reject it. It would be clear that the rules were not followed, which would raise a “red flag” of a data security issue. This is another feature of the blockchain: if someone provides an update that does not

⁴⁹ Riikka Koulu and Kalle Markkanen, “Conflict Management for Regulation-Averse Blockchains?” In *Regulating Industrial Internet Through IPR, Data Protection And Competition Law*, ed. by R. M. Ballardini, O. Pitkänen and P. Kuoppamäki, (ch. 19), Wolters Kluwer, 2019.

⁵⁰ *Ibid.*

follow the network rules, then the other nodes will evaluate the contribution and determine the update does not comply, so they will not add it to the definitive ledger.

That makes spoofing or editing information previously submitted into the blockchain extremely difficult, if not impossible. Indeed, it generally takes a “super computer” to even attempt the necessary computing challenges involved in “hacking” the blockchain.

This makes smart contracts built into the blockchain incredibly powerful. As noted above, smart contracts are already self-enforcing computer programs, but they become more secure when programmers drop them into the blockchain. Smart contracts eliminate the need for paper documents, penned signatures, and—for the most part—courts and lawyers. Smart contracts lodged in the blockchain strive for auto-enforcement through code instead of judges and courts⁵¹. This is why smart contract enthusiasts may talk about “code as law.”

Ideally, blockchain also provides safety because it provides encryption with public and private keys, which are blockchain-based identification numbers provided by the network⁵². In reality, however, blockchain is not impenetrable. It is more secure than general cloud-based systems, but it can be “hacked” and has its own risks⁵³. Hackers could manipulate the technology by, for example, using a “hard fork” to essentially create a copy of the blockchain which might allow unscrupulous parties to manipulate the data and “steal” information. Indeed, a well-executed “hard fork” could even make a blockchain vulnerable to corruption and collapse⁵⁴.

At the same time, blockchain is evolving and moving far beyond its origins in cryptocurrencies like Bitcoin. The central objective of the blockchain was to create a self-regulating network that would enable the transfer of property between peers without the oversight of a third party, namely the courts and regulators

⁵¹ Marco Dell'Erba, “Demystifying Technology. Do Smart Contracts Require a New Legal Framework? Regulatory Fragmentation, Self-Regulation, Public Regulation”, 20 Aug. 2018, pp. 27-28. <https://ssrn.com/abstract=3228445>

⁵² *Ibid.*, p. 9.

⁵³ Angela Walch, “Blockchain’s Treacherous Vocabulary: One More Challenge for Regulators,” in *Journal of Internet Law*, vol. 21, no. 2, Aug. 2017, pp. 5-7. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3019328

⁵⁴ *Ibid.*, pp. 2-7. Instead of claiming the technology is “tamper-proof,” some proponents now call it “tamper-resistant.” *Idem.*

⁵⁵. However, the original Bitcoin system has been improved in newer platforms like Ethereum, and even private chains are thriving to allow for efficiencies and security in a range of industries⁵⁶.

There has been a growth in initial coin offerings (“ICOs”), which are now recognized by the Securities and Exchange Commission and regulated as securities⁵⁷. Furthermore, smart contracts have gained prevalence in banking, finance, insurance, and supply chain management, while law firms are building blockchain departments⁵⁸. Their business clients have been experimenting with blockchain through venues like the Accord Project consortium⁵⁹. Meanwhile, major tech companies like IBM and standard setting groups like the IEEE have been working to set common data and performance standards for smart contracts, which are crucial for wide acceptance⁶⁰. In fact, ninety percent of Australian, European and North American banks are “experimenting” with using blockchain to verify and transfer financial “information and assets”⁶¹. Additionally, twenty-five governments were piloting blockchain platforms by 2018^[62].

Today, blockchain contracts are utilized in many industries well outside the domain of cryptocurrencies. For example, niche industries, like videogames are utilizing blockchain

⁵⁵ See generally Walch, “Blockchain’s Treacherous Vocabulary...,” *op. cit.*

⁵⁶ Brant Carson, Giulio Romanelli, Patricia Walsh and Askhat Zhumaev, “Blockchain Beyond the Hype: What is the Strategic Business Value?,” in *McKinsey Digital*, 19 June 2018. <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/blockchain-beyond-the-hype-what-is-the-strategic-business-value>

⁵⁷ *Ibid.*

⁵⁸ Roger Aitken, “Accord Project’s Consortium Launching First Legal ‘Smart Contracts’ with Hyperledger,” in *Forbes*, 26 July 2017. <https://www.forbes.com/sites/rogeraitken/2017/07/26/accord-projects-consortium-launching-first-legal-smart-contracts-with-hyperledger/#34781496472c>

⁵⁹ *Ibid.*

⁶⁰ Artificial Lawyer, “IBM Joins Accord Project Smart Contract Consortium,” in *Artificial Lawyer*, 28 June 2018. <https://www.artificiallawyer.com/2018/06/28/ibm-joins-accord-project-smart-contract-consortium>

⁶¹ Brant Carson *et al.*, “Blockchain Beyond the Hype: What is the Strategic Business Value?,” *op. cit.*

⁶² *Ibid.*

⁶³. Additionally, tech giant Microsoft has partnered with a company called EY to expand its usage of blockchain smart contracts to collect gaming rights and royalties from content creators⁶⁴. Previously, it would take Microsoft up to 45 days to calculate royalties, but their new process utilizing smart contracts attempts to calculate royalties in real time⁶⁵. Similarly, in the insurance industry, companies are capitalizing on IBM blockchain smart contracts to further safety and efficiency⁶⁶. For example, a company called Thai Reinsurance Public Co. Ltd. is using blockchain to create historical records of insurance documents⁶⁷.

It seems it will take some time for the industry to mature and develop, and it is unknown whether it will continue to expand or remain focused in niche areas. At present, however, it appears that blockchain will continue to expand and smart contracts will become a norm in many industries. Accordingly, disputes will develop and parties will seek means for resolving these disputes and obtaining remedies.

C. Disputes over smart contracts

Pindar Wong, the chairman of VeriFi (Hong Kong) Ltd and co-founder of the first licensed internet service provider in Hong Kong in 1993, has argued that these robust smart contracts could diminish the impact of trade wars⁶⁸. Mr. Wong observed:

[CITA] Trade warriors are fighting yesterday's battles. Instead of pitting their smokestack, 20th-century factories and armies of workers against each other,

⁶³ Ranica Arrowsmith, "EY and Microsoft Expand Xbox Blockchain Smart Contract Platform," in *Accounting Today*, 6 Jan. 2021. <https://www.accountingtoday.com/news/ey-and-microsoft-expand-xbox-blockchain-smart-contract-platform>

⁶⁴ *Ibid.*

⁶⁵ *Ibid.*

⁶⁶ Kyt Dotson, "Thai Re Launches Reinsurance Platform Powered by IBM Blockchain and Smart Contracts," in *Silicon Angle*, 7 Jan. 2021. <https://siliconangle.com/2021/01/07/thai-re-launches-reinsurance-platform-powered-ibm-blockchain-smart-contracts/>

⁶⁷ *Ibid.*

⁶⁸ Pindar Wong, "Blockchain's Killer App? Making Trade Wars Obsolete," in *Coindesk*, 21 May 2018. <https://www.coindesk.com/blockchains-killer-app-making-trade-wars-obsolete>

governments should apply blockchain's "Don't Trust, Verify" approach to trade arrangements, using it to reduce trade friction and improve cross-border relations to the betterment of their societies

The idea is that smart contracts allow parties to avoid tariffs and turf wars because they are housed in a decentralized ledger, and they guarantee performance or payment because the performance or payment is translated into immutable code. Moreover, this ledger is transparent, allowing parties to track shipments, payments, and other transactional occurrences every step of the way – without need for reliance on governments or even humans (assuming correct coding of the data). Furthermore, trust could be inherent with the transparency and automatic enforcement of the coded performance. Nonetheless, disputes will develop and a new kind of “trade war” could develop.

For starters, as noted above, there will be coding errors and disputes about the veracity and interpretation of the code. There is even a risk that fake data will improperly trigger, or fail to trigger, smart contract clauses. Computer coders could face damages for creating improperly structured contracts, while hackers may attempt to manipulate data to the advantage of one party or the other⁷⁰. Parties may fight about whether the code accurately memorializes their agreement, and even coders may dispute “interpretation” of the code⁷¹. Indeed, there may be questions around the legality of smart contracts in some jurisdictions.

At the same time, because each node of a blockchain ledger is potentially located in a different part of the world, blockchain ledgers do not have a clearly identified location or jurisdiction for each transaction. It is possible that parties could code jurisdictional choice into their smart contracts, but even that may be subject to public policy and statutory challenge within any one nation’s courts. Even if parties choose jurisdictions with laws requiring enforcement of smart contracts, traditional courts may not have the capacity and expertise to decide the disputes, and the inefficiencies of traditional courts would thwart the benefits of smart contracts.

⁶⁹ *Ibid.*

⁷⁰ *Ibid.*

⁷¹ Duncan Kennedy, “From the Will Theory to the Principle of Private Autonomy: Lon Fuller’s ‘Consideration and Form’,” *Columbia Law Review*, vol. 100, no. 1, 2000, pp. 94-175, p. 103; Lon L. Fuller, “Consideration and Form”, in *Columbia Law Review*, vol. 41, no. 5, May 1941, pp. 799-824, pp. 800-801.

In addition to questions around litigating smart contract disputes, questions loom regarding responsibility and accountability within the blockchain or other distributed ledger systems. By the nature of blockchain, there is no single owner of a blockchain system. That means it is unclear who should be held accountable for any flaw or failure. The very ethos is libertarian in the sense that communal “law” and shared understandings should govern operations.

The immutability of blockchain also raises questions of data privacy, which may create yet more disputes around data. Cross-border blockchain platforms are examples of public networks that will handle personal data. It will be difficult to balance an individual’s right to privacy in an open network, especially considering that many blockchain networks have little control over where data will be transferred and who has access to that data. Considering that, by its nature, blockchain is both transparent and private, should or does it matter who has access to the data? This creates especially thorny issues in light of the GDPR and other data legislation in various jurisdictions.

In sum, expected and unforeseen disputes will arise regarding smart contract coding and execution. Accordingly, parties are wise to build a dispute resolution plan into their blockchain strategy. Some disputes are inevitable as is true with any form of contract (smart or otherwise). Coding for possible breaches of contract can go only so far because there will always be a lack of foresight and information, as well as unpredictable human behavior⁷². At the same time, traditional litigation fails to address smart contracts’ need for remedies that preserve anonymity and fit within the blockchain culture. Courts and traditional processes simply will not work for resolving many smart contract disputes.

D. The need for ODR or OARB built into the blockchain

⁷² Amy J. Schmitz and Colin Rule, “Online Dispute Resolution for Smart Contracts,” *op. cit.*, pp. 110-115.

Currently, the leading means for regulating smart contracts seems to be to “reset” the system to avoid further damage. But this does not provide actual decisions on the disputes or remedies for those harmed. In other words, this is a measure to “stop bleeding” and does not resolve the disputes.

That said, there is some movement toward crowdsourced online dispute resolution (ODR). ODR providers like Kleros allow for this crowdsourced ODR by having token holders essentially be the jury and look at the evidence presented by each side. These token holders/jurors, who can be anyone who purchases tokens, then vote with tokens on the party that they think should “win” a given dispute. These token holders do not need any special background and remain anonymous, but they are “peers” in that they understand and work with digital ledgers, at least enough to be token holders. The side with the most tokens wins, and the token holders who chose that winning side get to take back their tokens along with the tokens of the voters who choose the “losing” side. The idea relies on a game theoretic model; Kleros implements other measures to stop “cheating” and attempting to game the system. The question, however, is whether this crowdsourced ODR is the product of good system design. It is also debatable whether the “winning” side is necessarily the “just” or “correct” resolution.

Dispute system design goes beyond consideration of positive law to consider goals, stakeholders, context and culture, processes and structures, resources, and more involved in a given situation. This allows us to think about the dispute resolution system in a much more contextualized way, responsive to the unique needs and expectations of a particular socio-legal culture. Parties to smart contracts are generally striving to protect privacy around their transactions and promote efficiency in business practices, as these are important goals behind smart contracts. Furthermore, access to decisionmakers with technological expertise would be vital for smart contract disputes. Indeed, one of the greatest fears around smart contract litigation is that generalist judges and juries lack necessary understanding of the complex technological issues often looming behind smart contract issues.

Accordingly, parties would be wise to address smart contract dispute resolution and establish best means for resolving these disputes in their smart contracts.

Legislators passing laws stating smart contracts are enforceable generally do not understand what smart contracts are, let alone the best means for resolving related disputes. Even tokenized ODR is more in tune with dispute system design than the default – “reset” the system and simply stop the bleeding once a smart contract goes awry. But tokenized ODR may be vulnerable to risks if not properly devised.

Instead, users of smart contracts may want to build arbitration into their code to promote efficiency, protect privacy and ensure an expert decisionmaker. Furthermore, users may want to specify allowance for online arbitration to augment this efficiency, especially given the cross-border nature of most smart contracts. Smart contract dispute resolution should honor and support the efficiency of smart contracts. Furthermore, smart contract users may want to even further support these dispute resolution mechanisms by placing disputed funds in escrow while arbitration takes place to help ensure trust and enforcement of decisions.

E. Towards a new era in conflict resolution: Integrating LLMS into the equation

The proliferation of electronic devices in our daily lives has led to an unprecedented accumulation of data, enabling these devices to predict user behaviors with remarkable accuracy⁷³. This advancement underscores the transition into Industry 5.0, where the integration of human creativity with machine precision will foster the development of innovative products and services⁷⁴. In particular, Industry 5.0 is going to revolutionize the supply chain and manufacturing sectors by incorporating AI and big data, enhancing productivity, operational efficiency, and environmental sustainability while ensuring workplace safety

⁷³ Gilberto Basilio Sánchez, “Las primeras cinco revoluciones industriales”, en *Cienciorama*, UNAM, 2018, p. 5. <http://www.cienciorama.unam.mx/#!titulo/585/?las-primeras-cinco-revoluciones-industriales>

⁷⁴ Praveen Kumar Reddy Maddikunta, Quoc-Viet Pham, B. Prabadevi, N. Deepa, Kapal Dev, Thippa Reddy Gadekallu, Rukhsana Ruby and Madhusanka Liyanage, “Industry 5.0: A Survey on enabling technologies and potential applications,” in *Journal of Industrial Information Integration*, vol. 26, 2022, p. 13. <https://doi.org/10.1016/j.jii.2021.100257>

The interconnectedness facilitated by AI-driven devices needs a thorough examination of data production, sharing, and tracking mechanisms⁷⁶. This network also heralds significant potential for legal reasoning and the broader legal field, although progress has been impeded by historical misunderstandings between lawyers and engineers⁷⁷. However, recent attention from AI experts towards legal applications signals a promising direction, especially for the development of expert systems capable of resolving specific inquiries with expert-level knowledge⁷⁸.

One of the most promising applications of this technology is the enhancement of the quality of work performed by lawyers, making complex legal knowledge accessible and understandable to ordinary citizens. Moreover, expert systems have the potential to ensure equal treatment of similar legal issues and establish an internal quality control system⁷⁹.

The integration of expert systems in the legal field represents a technological revolution with a significant impact on contemporary legal practice. Defined as logical environments capable of managing their own knowledge bases, solving specific and well-defined problems, generating new knowledge, and explaining their reasoning process⁸⁰, these systems offer unprecedented potential for diagnosis, advice, and decision-making assistance in legal matters. The effectiveness of expert systems is attributed to their ability to separate specific knowledge of a field from the processing applied to that knowledge, facilitating their potential to replicate the methodology and

⁷⁵ Saeid Nahavandi, "Industry 5.0—A Human-Centric Solution," in *Sustainability*, vol. 11, no. 16, 2019, 4371, pp. 10-11. <https://doi.org/10.3390/su11164371>

⁷⁶ Iria Giuffrida, Fredric Lederer, and Nicolas Vermerys, "A Legal Perspective on the Trials and Tribulations of AI: How Artificial Intelligence, the Internet of Things, Smart Contracts, and Other Technologies Will Affect the Law," *Case Western Reserve Law Review*, vol. 78, iss. 3, 2018, p. 750.

⁷⁷ Bruce G. Buchanan and Thomas E. Headrick, "Some Speculation Artificial Intelligence and Legal Reasoning," in *Stanford Law Review*, vol. 23, no. 1, 1970, pp. 40-62, pp. 41-42. <https://doi.org/10.2307/1227753>

⁷⁸ A. Kowalski, "Artificial Intelligence and Law: A Primer an Overview," in *Advocate* (Vancouver), vol. 51, 1993, p. 579.

⁷⁹ Richard Susskind, "Artificial Intelligence, Expert Systems and Law," in *The Denning Law Journal*, vol. 105, no. 1, 1990, pp. 105-116, p. 113. <https://doi.org/10.5750/dlj.v5i1.196>

⁸⁰ Danièle Bourcier, *Inteligencia artificial aplicada al derecho*, UOC, Barcelona, 2003, 11D vLex: 303867. <http://libros-revistas-derecho.vlex.es/vid/inteligencia-artificial-aplicada-derecho-303867>

steps a specialist would follow to produce a conclusion deemed acceptable by a judge⁸¹.

In the field of conflict resolution, specifically, there are many useful ways in which the means applied have been upgraded with integration of the different set of tools offered by technology. Negotiation support systems, for example, while not offering settlement formulas, provide crucial decision support by highlighting areas of agreement and measuring levels of disagreement⁸². Legal research tools as well, exemplified by Ross, have demonstrated superior efficiency and cost-effectiveness compared to traditional search engines, although they cannot replace the nuanced and morally informed judgment required in legal analysis⁸³.

For their part, Online Dispute Resolution (ODR) processes, enhanced by algorithms, not only streamline dispute resolution but also offer insights into customer loyalty and retention strategies⁸⁴. The increasing sophistication of dispute resolution platforms promises greater accessibility, fairness, and efficiency in handling disputes⁸⁵. Additionally, ODR has proven effective in transcending geographical and legal boundaries, offering a model for future dispute resolution mechanisms⁸⁶.

⁸¹ Pamela Katz, "Expert Robot: Using Artificial Intelligence to Assist Judges in Admitting Scientific Expert Testimony," in *Journal of Science and Technology*, vol. 24, Iss. 1, 2014, p. 40. <https://www.albanylawscitech.org/article/19207-expert-robot-using-artificial-intelligence-to-assist-judges-in-admitting-scientific-expert-testimony>

⁸² Arno R. Lodder and John Zeleznikow, "Artificial Intelligence and Online Dispute Resolution." In *Online Dispute Resolution: Theory and Practice*, ed. by M. A. Wahab, E. Katsh, and D. Rainey (pp. 73-94), Eleven International Publishing, The Hague, 2021, p. 75.

⁸³ Ross, "Artificial Intelligence and Legal Ethics: Whether AI Lawyers Can Make Ethical Decisions," p. 204.

⁸⁴ Leah Wing, "Artificial Intelligence and Online Dispute Resolution Systems Design," in *International Journal on Online Dispute Resolution*, vol. 4, no. 2, 2017, pp. 18-19.

⁸⁵ Scott Shackelford and Anjanette Raymond, "Building the Virtual Courthouse: Ethical Considerations for Design, Implementation, and Regulation in the World of ODR," in *Wisconsin Law Review*, 2014, pp. 615-657.

⁸⁶ H. Haloush, *The International Lawyer; Chicago*, tomo 42, N.º 3, p. 6.

However, the integration of AI into legal and societal systems raises several challenges, particularly concerning human rights in the digital age and the overarching impact of technological advancements on human well-being, ensuring impartiality⁸⁷ and transparency⁸⁸ in AI-driven decisions is crucial for maintaining public trust and adherence to ethical standards.

Furthermore, the legal profession faces unique hurdles from AI, given the complexity of societal norms and the dynamic nature of legal reasoning⁸⁹. The technological ecosystem's complexity requires vigilance against unforeseen risks arising from the interactions among AI technologies⁹⁰.

Programming uniform decisions in expert systems presents significant challenges, especially due to the particularities of each case and the inappropriate use of language to describe certain events, which can prove to be impractical⁹¹.

In this context, the emergence of Large Language Models (LLMs) marks a significant milestone. These models can perform statistical analysis based on the formal structure of information rather than formal texts, leveraging the impressive amount of available data, the increase in computing power, and the continuous improvement of algorithms⁹².

⁸⁷ Laurens Mommers, "Legitimacy and the virtualization of dispute resolution," in *Artificial Intelligence and Law*, vol. 13, 2005, pp. 207-232.

⁸⁸ Legal Services Community, "Principles and Guidelines for Due Process and Ethics in the Age of AI (Version 1.0)", 5 June 2018, p. 2. <http://bit.ly/elai-guide>

⁸⁹ E. Lashbrooke, "Legal Reasoning and Artificial Intelligence," in *Loyola of Los Angeles Law Review*, vol. 34, 2018, pp. 287 y ss.

⁹⁰ Iria Giuffrida, Fredric Lederer and Nicolas Vermeys, "A Legal Perspective on the Trials and Tribulations of AI...", *op. cit.*, p. 780.

⁹¹ Celeste Tito, "Artificial Intelligence: Can Computers Understand Why Two Legal Cases are Similar," *UIC John Marshall Journal of Information Technology & Privacy Law*, vol. 7, Iss. 3, 1987, p. 428.

⁹² Luciano Floridi, "AI as Agency Without Intelligence: on ChatGPT, Large Language Models, and Other Generative Models", in *Philosophy & Technology*, vol. 36, art. 15, 2023, pp. 14-15. <https://doi.org/10.1007/s13347-023-00621-y>

LLMs have proven to be highly accurate in multilingual interactions, facilitating global commerce, improving customer service outcomes, and generating higher financial returns⁹³. This accuracy extends to the analysis of legal texts, radically transforming the way these are analyzed and understood, thanks to natural language processing technology⁹⁴.

As the use of LLMs expands among the population, their effectiveness and reach are expected to do the same, transforming the decision-making process and affecting the way humans make judgments⁹⁵. Nonetheless, to increase the quality of the results and minimize the effects of biases, a systematic adjustment process specific to each field will be necessary⁹⁶.

As AI continues to evolve, the legal field must adapt, making legal services more accessible and efficient for those unfamiliar with legal jargon and procedures⁹⁷. The prospect of "robot arbitrators" and the application of large language models (LLMs) in legal text analysis signify major strides toward transforming legal research, analysis, and decision-making processes⁹⁸.

In this order of ideas, the integration of expert systems and LLMs in the legal area not only optimizes the efficiency and accuracy of legal processes but also democratizes access to legal knowledge, marking a turning point in the practice of

⁹³ Daniel Fallmann, "Generating insights and connecting information with large language models," in *KM World Magazine*, November/December 2023, pp. S20-S21.

⁹⁴ Mohammed Maree, Rabbe Al-Qasem and Banan Tantour, "Transforming legal text interactions: leveraging natural language processing and large language models for legal support in Palestinian cooperatives," in *International Journal of Information Technology*, vol. 16, 2024, pp. 551-558. <https://doi.org/10.1007/s41870-023-01584-1>

⁹⁵ Timm Teubner, Christoph M. Flath, Christof Weinhardt, Wil Aalst and Oliver Hinz, "Welcome to the Era of ChatGPT *et al.*," in *Business & Information Systems Engineering: The International Journal of Wirtschaftsinformatik*, vol. 65, no. 2, 2023, pp. 95-101, p. 99.

⁹⁷ Spyros Makridakis, Fotios Petropoulos and Yanfei Kang, "Large Language Models: Their Success and Impact," *Forecasting*, vol. 5, no. 3, 2023, pp. 536-549, pp. 546-547. <https://doi.org/10.3390/forecast5030030>

⁹⁷ Davide Carneiro, Paulo Jorge Novais, Francisco Assis de Andrade and John Zeleznikow, "Online dispute resolution: An artificial intelligence perspective," in *Artificial Intelligence Review*, vol. 41, no. 2, 2014, pp. 230-231.

⁹⁸ Amy Schmitz and Colin Rule, "OArb Enters the Age of Artificial Intelligence," in *Dispute Resolution Magazine*, vol. 29, no. 2, 2023, p. 37.

law. The continuous evolution of these technologies suggests a future where artificial intelligence plays a central role in defining justice and legal equity.

CONCLUSION

The exploration of integrating Online Dispute Resolution (ODR), Artificial Intelligence (AI), and Industry 5.0 within legal systems, brings to light the transformative potential of such amalgamation. As we advance, it is paramount to acknowledge that the synergy between technological innovation and the legal sector heralds a new dawn of justice, one that is more accessible and efficient.

As a matter of fact, the transformative impact of Online Dispute Resolution (ODR) on the legal landscape is undeniable. As we navigate the digital era, ODR emerges as a pivotal tool reshaping the way society approaches conflict resolution. This paradigm shift is propelled by the amalgamation of technology, particularly artificial intelligence, and the evolving expectations of a digitally empowered populace.

The ubiquity of technology has not only altered how we communicate but has also revolutionized how disputes are handled. From eCommerce grievances to complex legal matters, technology facilitates accessible, efficient, and transparent solutions. ODR, initially cultivated by entities like eBay to foster trust in online transactions, has transcended its origins. Its integration into conventional legal frameworks signifies a broader commitment to democratizing justice and mitigating costs.

The intersection of ODR with artificial intelligence and machine learning heralds a new era where swift and equitable resolutions become the norm. However, the journey towards this future is not without challenges. The ethical dilemmas accompanying ODR's expansion necessitate vigilant consideration. Questions surrounding bias, privacy, and the accountability of automated systems demand comprehensive exploration and resolution.

Moreover, as technology continues to evolve, so do the complexities of disputes. The advent of globalized digital interactions has birthed novel categories of disagreements, transcending traditional legal jurisdiction models. Consequently, a justice system reflective of the fluidity and speed of the digital realm becomes imperative. The call for a justice system that mirrors the agility of technology underscores the need for a paradigmatic shift in how we conceptualize and implement dispute resolution mechanisms.

The legal profession, often considered conservative, is not impervious to technological disruption. While other fields witnessed earlier and more profound transformations, the legal sector is now experiencing an irreversible impact. Disputants, fueled by technological expectations and disillusioned by the protracted nature of traditional legal processes, are catalysts for change. The demand for faster, cost-effective, and efficient resolutions is reshaping the legal landscape.

Also, the advent of Large Language Models (LLMs) and their application in legal text analysis and dispute resolution underscore the capacity of AI to democratize legal knowledge and services. This improvement towards making legal processes more comprehensible and accessible to the general populace marks a significant stride towards bridging the gap between the law and those it serves.

Despite the resistance embedded in legal monopolies, the trajectory towards digitization is inexorable. Self-Represented Litigants (SRLs) amplify the urgency for digital solutions. Technology, once a peripheral aspect of legal practice, is now at the forefront of innovation, challenging the status quo and propelling the legal domain into a new era.

As we confront the challenges and opportunities presented by ODR and its integration with emerging technologies, thoughtful design and system refinement become imperative. Crowdsourced ODR models, exemplified by platforms like Kleros, introduce novel approaches but raise questions about their efficacy and alignment with justice. Dispute system design must transcend positive law considerations and account for diverse goals, stakeholders, contexts, and cultural nuances.

Looking ahead, the fusion of ODR with blockchain technology holds promise, but careful consideration of its intricacies is paramount. The current reliance on system "resets" to manage smart contract disputes lacks the essential elements of decision-making and remedy provision. Crowdsourced models, while innovative, require rigorous scrutiny to ensure fairness and correctness in outcomes.

In crafting the future of ODR, acknowledging the symbiotic relationship between technological evolution and legal transformation is pivotal. Parties involved in smart contracts must proactively address dispute resolution within their frameworks, considering the unique characteristics and challenges posed by these digital agreements. Arbitration, embedded in code, presents an efficient avenue, while tokenized ODR and escrow mechanisms offer potential enhancements.

Even with the significant progress that has been achieved in launching and refining ODR platforms and best practices, we are likely still at the beginning of ODR's development. The cutting-edge online dispute resolution platforms we marvel at today will likely seem quite primitive and retro just five years from now. New technologies on the horizon like smart contracts⁹⁹, blockchain¹⁰⁰, LLMs and quantum computing will one day make our current efforts seem crude and ineffective. But we will not be able to get to those next-generation technologies without taking the intermediate steps available to us today.

It may be that a generation or two from now disputants will look back on our era of human powered justice as hopelessly biased and seemingly random in its operations and outcomes. Just like future passengers who will be driven around by algorithms instead of humans (and who will regard the era of human driven automobiles as frighteningly dangerous, inefficient, and unpredictable), future disputants may also regard our current system as unacceptable and unjust in comparison to their algorithmic justice processes managed by advanced artificial intelligence and robojudges. All we can do is the best we are capable of with our

⁹⁹ Amy Schmitz and Colin Rule, "Online Dispute Resolution for Smart Contracts", *op. cit.*

¹⁰⁰ Orna Rabinovich-Einy and Ethan Katsh, "Blockchain and the Inevitability of Disputes: The Role for Online Dispute Resolution," in *Journal of Dispute Resolution*, vol. 2019, no. 2, 2019, art. 6. <https://scholarship.law.missouri.edu/cgi/viewcontent.cgi?article=1837&context=jdr>

current tools, striving to live up to our ethical obligations and best practices in designing the most effective justice system we can currently create. Embracing these opportunities and continuously learning will help to move us toward our ultimate objective: a resolution system that provides fast and fair justice for all.

In this order of ideas, ODR stands at the nexus of societal evolution, legal innovation, and technological progress. It beckons us to reconceptualize justice, envisioning a system that mirrors the interconnected and dynamic nature of the digital age. As we navigate this paradigm shift, the collaborative efforts of legal experts, technologists, and policymakers will determine the trajectory and efficacy of ODR in fostering a better justice system for the future.

BIBLIOGRAPHY

Aitken, Roger, "Accord Project's Consortium Launching First Legal 'Smart Contracts' with Hyperledger," in *Forbes*, 26 July 2017. <https://www.forbes.com/sites/rogeraitken/2017/07/26/accord-projects-consortium-launching-first-legal-smart-contracts-with-hyperledger/#34781496472c>

Amsler, Terry. "Community Dispute Resolution: Assessing Its Importance and Addressing Its Challenges," in *Dispute Resolution Magazine*, vol. 19, no. 2, 2013, pp. 4-6. <https://www.yumpu.com/en/document/read/21987413/winter-2013-dispute-resolution-magazine-american-bar-association>

Anderson, Monica; Perrin, Andrew; Jiang, Jingjing, and Kumar, Madhumitha, "10 % of Americans don't use the internet. Who are they?," in *Pew Research Center Fact Tank*, 22 Apr. 2019. <https://www.pewresearch.org/fact-tank/2019/04/22/some-americans-dont-use-the-internet-who-are-they/>

Andreesen, Marc, "Why Software is Eating the World," in *Andreessen Horowitz*, 20 Aug. 2011. <https://a16z.com/2011/08/20/why-software-is-eating-the-world/>

Arrowsmith, Ranica, "EY and Microsoft Expand Xbox Blockchain Smart Contract Platform," in *Accounting Today*, 6 Jan. 2021.

<https://www.accountingtoday.com/news/ey-and-microsoft-expand-xbox-blockchain-smart-contract-platform>

Artificial Lawyer, "IBM Joins Accord Project Smart Contract Consortium," in *Artificial Lawyer*, 28 June 2018. <https://www.artificiallawyer.com/2018/06/28/ibm-joins-accord-project-smart-contract-consortium>

Bourcier, Danièle, *Inteligencia artificial aplicada al derecho*, UOC, Barcelona, 2003, 11D vLex: 303867. <http://libros-revistas-derecho.vlex.es/vid/inteligencia-artificial-aplicada-derecho-303867>

Buchanan, Bruce G., and Headrick, Thomas E., "Some Speculation Artificial Intelligence and Legal Reasoning," in *Stanford Law Review*, vol. 23, no. 1, 1970, pp. 40-62. <https://doi.org/10.2307/1227753>

Carneiro, Davide; Novais, Paulo Jorge; Andrade, Francisco Assis de, and Zeleznikow, John, "Online dispute resolution: An artificial intelligence perspective," in *Artificial Intelligence Review*, vol. 41, no. 2, 2014.

Carson, Brant; Romanelli, Giulio; Walsh, Patricia and Zhumaev, Askhat, "Blockchain Beyond the Hype: What is the Strategic Business Value?," in *McKinsey Digital*, 19 June 2018. <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/blockchain-beyond-the-hype-what-is-the-strategic-business-value>

Condlin, Robert J. "Online Dispute Resolution: Stinky, Repugnant, or Drab," in *Cardozo Journal of Conflict Resolution*, vol. 18, 2017, pp. 717-758. https://digitalcommons.law.umaryland.edu/cgi/viewcontent.cgi?article=2580&context=fac_pubs

Corvalán, Juan Gustavo, “Artificial Intelligence: Challenges and Opportunities- Prometea: The First Artificial Intelligence of Latin America at the Service of the Justice System”, in *Revista de Investigações Constitucionais*, vol. 5, no. 1, 2018. <https://doi.org/10.5380/rinc.v5i1.55334>

Dell’Erba, Marco, “Demystifying Technology. Do Smart Contracts Require a New Legal Framework? Regulatory Fragmentation, Self-Regulation, Public Regulation,” 20 Aug. 2018. <https://ssrn.com/abstract=3228445>

Dotson, Kyt. “Thai Re Launches Reinsurance Platform Powered by IBM Blockchain and Smart Contracts,” in *Silicon Angle*, 7 Jan. 2021. <https://siliconangle.com/2021/01/07/thai-re-launches-reinsurance-platform-powered-ibm-blockchain-smart-contracts/>

Dyer, Charles, “Self-Represented Litigants: A Guide for Government and Court Decision Makers,” *GLL Resource Guide*, no. 4, 2018. Available from: <https://www.aallnet.org/gllsis/wp-content/uploads/sites/9/2018/01/scllguide4.pdf>

Ebner, Noam, “ODR and Interpersonal Trust,” in *Online Dispute Resolution: Theory and Practice: A Treatise on Technology and Dispute Resolution*, ed. by Daniel Rainey, Ethan Katsh and Mohamed Abdel Wahab, Eleven International Publishers, 2012.

Edwards, Jim, "Uber Is Destroying the Value of Taxi Monopolies in a Bunch of American Cities," in *Business Insider*, 28 Nov. 2014. <https://www.businessinsider.com/uber-destroying-value-of-taxi-monopolies-cartels-2014-11>

Fallmann, Daniel, "Generating insights and connecting information with large language models," in *KM World Magazine*, November/December 2023, pp. S20-S21.

Floridi, Luciano, "AI as *Agency Without Intelligence*: on ChatGPT, Large Language Models, and Other Generative Models, in *Philosophy & Technology*, vol. 36, art. 15, 2023, pp. 14-15. <https://doi.org/10.1007/s13347-023-00621-y>

Fuller, Lon L., "Consideration and Form", in *Columbia Law Review*, vol. 41, no. 5, May 1941, pp. 799-824.

Giuffrida, Iria; Lederer, Fredric, and Vermeys, Nicolas, "A Legal Perspective on the Trials and Tribulations of AI: How Artificial Intelligence, the Internet of Things, Smart Contracts, and Other Technologies Will Affect the Law," in *Case Western Reserve Law Review*, vol. 68, iss. 3, 2018, pp. 747-781.

Haloush, H. *The International Lawyer; Chicago*, tomo 42, N.º 3, p. 6.

Haris, Adil, "Smart Contracts – A Simple yet Comprehensive Explanation in Pictures," in *Hackernoon*, 23 Mar. 2019. <https://hackernoon.com/smart-contracts-a-simple-yet-comprehensive-explanation-in-pictures-bc21c7ab89b6>

Hector, Matthew, "Declining court caseloads reflect societal, other changes," in *Illinois Bar Journal*, vol. 104, no. 3 Mar. 2016.
<https://www.isba.org/ibj/2016/03/lawpulse/decliningcourtcaseloadsreflectsocie>

Himonas, Deno, "Utah's Online Dispute Resolution Program," *Dickinson Law Review*, vol. 122, Iss. 3, 2018.
<https://ideas.dickinsonlaw.psu.edu/dlr/vol122/iss3/6/>

iDatalabs, "Companies Using Verisign," 2017.
<https://idatalabs.com/tech/products/verisign>

Kane, Sally, "Top Advantages of Legal Process Outsourcing (LPO)," in *LiveAbout*, 20 Nov. 2019. <https://www.thebalancecareers.com/top-advantages-of-outsourcing-2164339>

Katsh, Ethan, and Rifkin, Janet, *Online Dispute Resolution: Resolving Conflicts in Cyberspace*, Jossey-Bass, San Francisco, 2001.

Katsh, Ethan and Rule, Colin, "What We Know and Need to Know About Online Dispute Resolution," in *South Carolina Law Review*, vol. 67, Iss. 2, article 10, 2016.
https://www.americanbar.org/content/dam/aba/images/office_president/katsh_rule_whitepaper.pdf

Katz, Pamela, "Expert Robot: Using Artificial Intelligence to Assist Judges in Admitting Scientific Expert Testimony," in *Journal of Science and Technology*, vol. 24, Iss. 1, 2014. <https://www.albanylawscitech.org/article/19207-expert-robot-using-artificial-intelligence-to-assist-judges-in-admitting-scientific-expert-testimony>

Kennedy, Duncan, "From the Will Theory to the Principle of Private Autonomy: Lon Fuller's 'Consideration and Form'," in *Columbia Law Review*, vol. 100, no. 1, 2000, pp. 94-175.

Knowlton, Natalie *et al.*, *Cases Without Counsel*, IAALS Research Report, May 2016.

https://iaals.du.edu/sites/default/files/documents/publications/cases_without_counsel_research_report.pdf

Koulu, Riikka and Markkanen, Kalle, "Conflict Management for Regulation-Averse Blockchains?" In *Regulating Industrial Internet Through IPR, Data Protection and Competition Law*, ed. by. R.M. Ballardini, O. Pitkänen and P. Kuoppamäki, (ch. 19), Wolters Kluwer, 2019.

Kowalski, A., "Artificial Intelligence and Law: A Primer an Overview", in *Advocate* (Vancouver), vol. 51, 1993, p. 579.

Kozak, Leanne, "Judicial Branch Budget Cuts", in *California Courts News*, 26 July 2011. <https://www.courts.ca.gov/14876.htm>

Larson, David A., "Online Dispute Resolution: Do You Know Where Your Children Are?", in *Negotiation Journal*, vol. 19, no. 3, 2003, p. 199. Available from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=945682

Larson, David Allen, "Artificial Intelligence: Robots, Avatars, and the Demise of the Human Mediator," in *Ohio State Journal on Dispute Resolution*, vol. 25, no. 1, 2010, pp. 105-163. <https://open.mitchellhamline.edu/cgi/viewcontent.cgi?article=1352&context=acsch>

Lashbrooke, E. "Legal Reasoning and Artificial Intelligence," in *Loyola of Los Angeles Law Review*, vol. 34, 2018, pp. 287 y ss.

Legal Services Community, "Principles and Guidelines for Due Process and Ethics in the Age of AI (Version 1.0)", 5 June 2018. <http://bit.ly/elai-guide>

Lodder, Arno R., and Zeleznikow, John. "Artificial Intelligence and Online Dispute Resolution". .” In *Online Dispute Resolution: Theory and Practice*, ed. by M. A. Wahab, E. Katsh, and D. Rainey (pp. 73-94), Eleven International Publishing, The Hague, 2021.

Lucas, Lauren, and Meals, Darcy, "Every year, millions try to navigate US courts without a lawyer," in *The Conversation*, 22 Sept. 2017. <http://theconversation.com/every-year-millions-try-to-navigate-us-courts-without-a-lawyer-84159>

Maddikunta, Praveen Kumar Reddy; Pham, Quoc-Viet; Prabadevi, B; Deepa, N.; Dev, Kapal; Gadekallu, Thippa Reddy; Ruby, Rukhsana and Liyanage, Madhusanka, "Industry 5.0: A Survey on enabling technologies and potential applications," in *Journal of Industrial Information Integration*, vol. 26, 2022. <https://doi.org/10.1016/j.jii.2021.100257>

Makridakis, Spyros, Petropoulos, Fotios, and Kang, Yanfei, "Large Language Models: Their Success and Impact," *Forecasting*, vol. 5, no. 3, 2023, pp. 536-549. <https://doi.org/10.3390/forecast5030030>

Maree, Mohammed; Al-Qasem, Rabbe, and Tantour, Banan, "Transforming legal text interactions: leveraging natural language processing and large language models for legal support in Palestinian cooperatives," in *International Journal of Information Technology*, vol. 16, 2024, pp. 551-558. <https://doi.org/10.1007/s41870-023-01584-1>

Matterhorn, "Online Dispute Resolution (ODR)." <https://getmatterhorn.com/>
(Accessed 7 Nov. 2019).

Miller, Jack, "Law Schools Face Diminished Enrollment Numbers," in *The Heights*,
10 Feb. 2019. <https://bcheights.com/2019/02/10/law-schools-face-diminished-enrollment-numbers/>

Moffitt, Michael, "Before the Big Bang: The Making of an ADR Pioneer," in
Negotiation Journal, vol. 22, no. 4, 2006, pp. 437-443.
<https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1571-9979.2006.00112.x>

Mommers, Laurens, "Legitimacy and the virtualization of dispute resolution," in
Artificial Intelligence and Law, vol. 13, 2005, pp. 207-232.

Nahavandi, Saeid, "Industry 5.0—A Human-Centric Solution," *Sustainability*, vol. 11,
no. 16, 2019, 4371. <https://doi.org/10.3390/su11164371>

National Center for State Courts. *JTC Resource Bulletin. ODR for Courts* (version 2.0), 29 Nov. 2017.
https://www.ncsc.org/__data/assets/pdf_file/0033/39579/JTC-Resource-Bulletin-Case-Studies.pdf

The National Centre for Technology & Dispute Resolution, "NCSC/Pew Charitable Trusts ODR Project Announcement," 10 July 2018. <http://odr.info/ncscpew-charitable-trusts-odr-project-announcement/>

The Pew Charitable Trusts, "Online Dispute Resolution Moves from E-Commerce to the Courts", in *Pew Charitable Trusts*, 4 June 2019.
<https://www.pewtrusts.org/en/research-and-analysis/articles/2019/06/04/online-dispute-resolution-moves-from-e-commerce-to-the-courts>

The Pew Charitable Trusts, "Online Dispute Resolution Offers a New Way to Access Local Courts," in *Pew Trusts Fact Sheet*, 4 Jan. 2019.
<https://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2019/01/online-dispute-resolution-offers-a-new-way-to-access-local-courts>

PR Newswire, "American Arbitration Association Selects Modria to Power New York No Fault Caseload," 5 Mar. 2014.

<https://www.prnewswire.com/news-releases/american-arbitration-association-selects-modria-to-power-new-york-no-fault-caseload-248543191.html>

Quotersearch, "Exploring the supposed quote from Willie Sutton," in *Quote Investigator*, 10 Feb. 2013. <https://quoteinvestigator.com/2013/02/10/where-money-is/> (Accessed 7 July 2019).

Rabinovich-Einy, Orna, and Katsh, Ethan, "Blockchain and the Inevitability of Disputes: The Role for Online Dispute Resolution," in *Journal of Dispute Resolution*, vol. 2019, no. 2, 2019, art. 6. <https://scholarship.law.missouri.edu/cgi/viewcontent.cgi?article=1837&context=jdr>

Rigertas, Laurel, "The Legal Profession's Monopoly: Failing to Protect Consumers," in *Fordham Law Review*, vol. 82, 2014. http://fordhamlawreview.org/wp-content/uploads/assets/pdfs/Vol_82/No_6/Rigertas_May.pdf

Ross, Graham, "Final Report of the UK CJC ODR Committee", in *The National Centre for Technology & Dispute Resolution*, 7 Dec. 2018. <http://odr.info/cjc/>

Rule, Colin, and Wilson, Mark, "Online Resolution and Citizen Empowerment: Property Tax Appeals in North America." In *Revolutionizing the Interaction between State and Citizens through Digital Communications*, edited by Sam B. Edwards III and Diogo Santos

, Information Resources Management Association, 2015.
<http://www.colinrule.com/writing/assessments.pdf>

Rule, Colin, "Making Peace on eBay: Resolving Disputes in the World's Largest Marketplace", in *ACResolution Magazine*, Fall 2008.
<http://colinrule.com/writing/acr2008.pdf>

Sánchez, Gilberto Basilio, "Las primeras cinco revoluciones industriales", en *Cienciorama*, UNAM, 2018.
<http://www.cienciorama.unam.mx/#!titulo/585/?las-primeras-cinco-revoluciones-industriales>

Sander, Frank E. A., and Goldberg, Stephen B., "Fitting the Forum to the Fuss: A User-Friendly Guide to Selecting an ADR Procedure," in *Negotiation Journal*, vol. 10, no. 1, 1994, pp. 49-68.
<https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1571-9979.1994.tb00005.x>

Schmitz, Amy, and Rule, Colin, "OArb Enters the Age of Artificial Intelligence," in *Dispute Resolution Magazine*, vol. 29, no. 2, 2023.

Schmitz, Amy, and Rule, Colin, "Online Dispute Resolution for Smart Contracts," in *Journal of Dispute Resolution*, vol. 2019, Iss. 2, 2019, pp. 103-125.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3410450

Schmitz, Amy J., and Rule, Colin, *The New Handshake: Online Dispute Resolution and the Future of Consumer Protection*, At ix, 2017.

Schmitz, Amy, "Building Trust in eCommerce Through Online Dispute Resolution," in *Research Handbook on Electronic Commerce Law*, ed. by John A. Rothchild, Edward Elgar, 2016, U. of Colorado Law Legal Studies Research Paper no. 15-15.
<https://lawweb.colorado.edu/profiles/pubpdfs/schmitz/SchmitzBuildingTrustinEcommerceThroughOnlineDisputeResolution.pdf>

Shackelford, Scott and Raymond, Anjanette, "Building the Virtual Courthouse: Ethical Considerations for Design, Implementation, and Regulation in the World of ODR," in *Wisconsin Law Review*, 2014, pp. 615-657.

Steiner, Ina, "Report Holds eBay Dispute Resolution as Model for Courts," in *eCommerceBytes*, 16 Feb. 2015,
<https://www.ecommercebytes.com/C/blog/blog.pl?pl/2015/2/1424141431.html>

Sternlight, Jean R., "Pouring a Little Psychological Cold Water on ODR," in *Journal of Dispute Resolution*, no. 1, 2020.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3446140

Susskind, Richard, "Artificial Intelligence, Expert Systems and Law," in *The Denning Law Journal*, vol. 105, no. 1, 1990, pp. 105-116, p. 113.
<https://doi.org/10.5750/dlj.v5i1.196>

Susskind, Richard, *Tomorrow's Lawyers: An Introduction to Your Future*. Oxford University Press, 2013.

Szczerbowski, Jakub J. "Place of Smart Contracts in Civil Law. A Few Comments on Form and Interpretation," *Proceedings of the 12th Annual International Scientific Conference New Trends 2017*, 8 Jan. 2018.
<https://ssrn.com/abstract=3095933>

Tardi, Carla, "Moore's Law," in *Investopedia.com*, 5 Sep. 2019,
<https://www.investopedia.com/terms/m/mooreslaw.asp>

Teubner, Timm; Flath, Christoph M.; Weinhardt, Christof; Aalst, Wil, and Hinz, Oliver, "Welcome to the Era of ChatGPT *et al.*," in *Business & Information Systems Engineering: The International Journal of Wirtschaftsinformatik*, vol. 65, no. 2, 2023, pp. 95-101.

Tito, Celeste, "Artificial Intelligence: Can Computers Understand Why Two Legal Cases are Similar," *UIC John Marshall Journal of Information Technology & Privacy Law*, vol. 7, Iss. 3, 1987, pp. 409 y ss.

Tyler Technologies, "Modria." <https://www.tylertech.com/products/modria> (Accessed 7 Nov. 2019).

Walch, Angela, "Blockchain's Treacherous Vocabulary: One More Challenge for Regulators," in *Journal of Internet Law*, vol. 21, no. 2, Aug. 2017, pp. 5-7. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3019328

Wing, Leah, "Artificial Intelligence and Online Dispute Resolution Systems Design," in *International Journal on Online Dispute Resolution*, vol. 4, no. 2, 2017, pp. 18-19.

Wong, Pindar, "Blockchain's Killer App? Making Trade Wars Obsolete," in *Coindesk*, 21 May 2018. <https://www.coindesk.com/blockchains-killer-app-making-trade-wars-obsolete>

Xia, Sara, "China's Internet Courts are Spreading; Online Dispute Resolution is Working," in *China Law Blog*, 23 Dec. 2018. <https://www.chinalawblog.com/2018/12/chinas-internet-courts-are-spreading-online-dispute-resolution-is-working.html>

Zaslowsky, David, "What to Expect When Litigating Smart Contract Disputes," in *Law360*, 4 Apr. 2018. <https://www.law360.com/articles/1028009/what-to-expect-when-litigating-smart-contract-disputes>