

Technological Challenges Facing the Judiciary

Albert H. Yoon

James Branch Cabell wrote, “The optimist proclaims that we live in the best of all possible worlds, and the pessimist fears this is true.” This witticism also applies to our present-day legal profession. Technological advances, having previously transformed labor markets that relied on physical labor, have in recent years influenced labor markets that rely on human thinking and judgment. During the 1980s, the legal profession underwent a dramatic shift from physical to electronic texts. Notwithstanding this change, the profession remained largely static for the next quarter century, with lawyers still required to process the texts, a time-consuming and costly process.

The advent of legal technology over the past decade has transformed the legal market. Companies – including many start-ups – have developed tools to help lawyers process information faster, assisting them in contract formation, discovery, and compliance, to name but a few.¹ More recent technologies use artificial intelligence (AI) to enable litigants to better understand their own case in light of existing legal precedent, predicting how a court would decide their case.

The optimist observes these developments and sees a world of potential. As in the past, new technologies will benefit consumers. The cost of legal services will decline, solving the paradoxical and seemingly intractable problem of a surfeit of both lawyers and litigants. The business model of the legal profession, long reliant on margin over volume, could reverse itself as legal technology enables lawyers to help more clients in less time.

The pessimist, observing the same developments, fears worsening inequalities that already hinder the legal profession. Thus far, legal technology has primarily catered

See JAMES BRANCH CABELL, *THE SILVER STALLION: A COMEDY OF REDEMPTION* (1926)

¹ For a helpful discussion of the legal tech landscape, see David Freeman Engstrom & Jonah B. Gelbach, *Legal Tech, Civil Procedure, and the Future of Adversarialism*, 169 U. PA. L. REV. 1001 (2021).

to wealthier litigants, beyond what most lawyers – for example, solo or small-firm practitioners – can afford. These technologies will, as Marc Galanter prophesied nearly half a century ago, allow the “haves” to yet again come out ahead of the “have-nots.”²

This chapter identifies with both the optimist and the pessimist. The path toward a more efficient, democratized legal profession is within our reach. More to the point, the courts can help with this transition. Legal technology is expensive in part because judicial data is a barrier to entry. Legal technology centers around access to court documents – decisions and dockets – that are the foundation for data analytics. These documents are public, but often inaccessible and costly to access.³ Courts could eliminate these barriers by making these documents freely and directly available to the public. While this data may subject them to heightened scrutiny, courts should embrace this trade-off. This scrutiny already occurs, albeit from the smaller subset of the lawyers who represent well-resourced clients. Second, this release of data will have a progressive effect on access to legal analytics, benefitting a wider range of litigants.

This chapter proceeds as follows. Section 15.1 discusses the evolution of legal practice, which until recently has remained unchanged for much of its history. The predicament facing the courts is set forth in Section 15.2: some financial, but much of it institutional and cultural. Section 15.3 describes a path forward, partially initiated by the COVID-19 pandemic, but also the change in the composition of judges over time. Section 15.4 concludes.

15.1 THE EVOLUTION OF LEGAL PRACTICE

Historically, the legal profession has undergone little change. Clients retain lawyers to solve their problems. Lawyers gather information from their clients and situate the client’s case within the current law. Until recently, lawyers’ task in effectively representing their clients has been a labor-intensive undertaking.⁴ Lawyers are trouble-shooters, tasked with mapping their clients’ problems into one or more legal issues. To do so, they must first determine the relevant legal authority, and then how this authority relates to the clients’ situation.

15.1.1 *The Stubbornness of High Legal Fees*

The effort required to represent clients explains in large part why legal fees are expensive. Understanding their clients’ circumstances requires effort and time; so

² Marc Galanter, *Why the “Haves” Come Out Ahead: Speculations on the Limits of Legal Change*, 9 LAW & SOC’Y REV. 95 (1974).

³ See Simon Stern, *Copyright Originality and Judicial Originality*, 63 U. TORONTO L.J. 385 (2013).

⁴ See RICHARD E. SUSSKIND, *TOMORROW’S LAWYERS: AN INTRODUCTION TO YOUR FUTURE* (2017).

too does understanding the relevant legal authority. And the economies of scale are limited, as each client is unique. As lawyers gain experience, they are able to work more efficiently, accomplishing more over the same unit of time than less-experienced lawyers. To reflect this experience, however, experienced lawyers often are more expensive.⁵

In *The Cost Disease*, William Baumol and William Bowen explain how certain jobs rise in compensation, even in the absence of an increase in labor productivity.⁶ The authors characterize two types of jobs: (1) workers who become more productive over time, in large part due to technology and innovation and (2) workers largely immune to these advances. Auto workers provide an example of the former: because technology allows each worker to contribute more efficiently to the production of a car, her hourly wages have plateaued, even declined, as machines have come to perform more of the assembly process. For the latter, a string quartet: musicians devote the same amount of time to perform Beethoven today as did their predecessors. Compensation for workers in these technology-resistant fields rises if demand for these services remains constant and employers have to compete for these workers.

Until recently, lawyers were more akin to classical musicians than auto workers. The effort required to represent clients over time has remained stubbornly consistent. While digital libraries have enabled lawyers to identify relevant legal materials more efficiently, lawyers still have to process them.⁷ Lawyers historically used leverage to contain legal fees: partners delegating the straightforward and labor-intensive work to less-expensive associates.⁸ But the rate-limiting factor remains human effort, which – when unaffected by gains in productivity – becomes increasingly expensive.

The legal profession licensure requirements also create barriers to entry. The practice of law requires attending law school and passing the bar, reducing the supply of lawyers.⁹ Over time, non-lawyers have engaged in certain legal work,

⁵ Sharon Miki, *Lawyer Statistics for Success in 2022*, CLIO (Mar. 15, 2022), <https://www.clio.com/blog/lawyer-statistics/>. The highest was in DC, at \$380, and the lowest was in West Virginia, at \$166. But partners at some elite law firms charge over \$1,000 per hour, and there is at least one documented case of a firm charging \$1,795. See Samantha Stokes, *Will Billing Rates for Elite Firms Rise More in 2020?* THE AM. LAW. (July 30, 2020), <https://www.law.com/americanlawyer/2020/07/30/will-billing-rates-for-elite-firms-rise-more-in-2020/>.

⁶ See WILLIAM J. BAUMOL, *THE COST DISEASE: WHY COMPUTERS GET CHEAPER AND HEALTH CARE DOESN'T* (2012).

⁷ See Emery G. Lee II, *Law without Lawyers: Access to Civil Justice and the Cost of Legal Services*, 69 U. MIA. L. REV. 499 (2015).

⁸ See Albert H. Yoon, *The Post-Modern Lawyer: Technology and the Democratization of Legal Representation*, 66 U. TORONTO L.J. 456 (2016).

⁹ Received wisdom seems to suggest that there are plenty of law graduates, yet they are underemployed. Emily A. Spieler, *The Paradox of Access to Civil Justice: The “Glut” of New Lawyers and the Persistence of Unmet Need*, 44 U. TOLEDO L. REV. 365, 365–403 (2013).

under the authority of lawyers, and in some instances entirely on their own.¹⁰ But even as non-lawyers reduce legal fees, human labor remains the rate-limiting factor.

15.1.2 *Three Stages of Lawyering*

For all these reasons, the legal profession has enjoyed an extended period operating as a well-paying guild.¹¹ Until recently, the fundamental nature of legal practice remained unchanged, even as the profession adopted new technologies. During that time, the profession has evolved across three stages: from *analog* to *digital* to *computational*.¹² It is only the third and latest transition that seems poised to force the legal profession to fundamentally change its approach, both conceptual and financial.¹³ I briefly summarize these stages.

Analog. This stage represents the era where lawyers relied on hard copies of legal references – for example, case reporters, treatises, regulations, statutes, restatements – in their course of their legal work. This era’s defining feature is that the lawyers themselves were the sole mechanism to process these references and to apply them to their clients’ situation. Humans were the rate-limiting factor in the speed and efficacy of legal representation. Although varying in ability, lawyers performed tasks primarily as a linear function of the hours worked. Accordingly, larger law firms were able to take on more complex work because they could deploy larger numbers of lawyers onto a legal problem.

Digital. This stage coincided with the emergence of two technological developments during the 1980s: the personal computer and the creation of electronic legal libraries. The personal computer enabled greater efficiency. Lawyers who previously used typewriters found that an electronic format allowed them to write, edit, and share documents more easily. The advent of electronic legal libraries – notably Westlaw and LexisNexis – enabled lawyers to conduct their legal research through a dedicated terminal and, soon thereafter, on their personal computer. At a minimum, lawyers could access any decision, statute, or regulation by looking up its citation. Even more helpfully, lawyers could use keywords to identify the universe of relevant materials. The advent of electronic legal libraries untethered lawyers from physical reference materials, while simultaneously allowing them to digitally memorialize their work. These advances improved the rate of production, but, as with the analog stage, lawyer productivity remained a function of hours worked.

¹⁰ For example, the Law Society of Ontario in 2007 began regulating paralegals to address concerns of inadequate access to legal services. See Access to Justice Act, 2006, S.O. 2006, c 21 (Can.).

¹¹ See Mark A. Cohen, *Goodbye Guild – Law’s Changing Culture*, FORBES (July 3, 2017), <https://www.forbes.com/sites/markcohen/2017/07/03/goodbye-guild-laws-changing-culture/>.

¹² Benjamin Alarie, Anthony Niblett & Albert Yoon, *How Artificial Intelligence Will Affect the Practice of Law*, 68 U. TORONTO L.J. 106, 112 (Supp. 2018).

¹³ For a fuller discussion of these stages, see *id.*

Computational. This latest stage coincided with the emergence of AI and its application to law. Early developments during this stage are really extensions of the analog era, made possible because of the increased digitization of legal records. Discovery is one such example. During this pre-trial process, lawyers ask opposing counsel for materials – usually in the form of documents – that they believe could be legally relevant. The process historically required lawyers to read each document. Digitization expedites the process by allowing lawyers to electronically search for relevant words or phrases. A plethora of e-discovery start-ups exists to assist in this process.¹⁴ What once required a small army of lawyers now requires a single lawyer and a few lines of code.

As its name suggests, the computational stage refers to the ability of machines (computers) to go beyond identifying relevant legal references, drawing upon these references, in conjunction with specific information about a client case, to generate legal analysis. It uses two methods of AI: machine learning (ML) and natural language processing (NLP), described briefly below.

ML statistically analyzes structured data to predict outcomes.¹⁵ This process draws upon regression analysis, commonly used in both STEM and social sciences, as a means to test hypotheses by looking at data generated by observable phenomena. The difference lies in the objective: Rather than use regressions to *explain* outcomes, ML seeks to *predict* them. ML in legal technology involves digitizing legal information. Information from legal references – notably cases – can be expressed as pieces of data. These variables can be binomial in nature (is something X or Y); multinomial (is something A, B, C, D, etc.); or continuous (e.g., earnings, damages).

To illustrate: Whether a worker is an employee or independent contractor¹⁶ frequently arises in tax and employment law, determining the rights and obligations of the worker. In most jurisdictions, courts weigh several factors – for example, the amount of training, who sets the hours, the right to delegate work – in making this determination. It is possible to code published decisions into a dataset that captures how courts weigh these factors in reaching their decisions. ML can predict, given a specific set of facts, how a court would decide this matter, given existing precedent. Transforming written text to bytes of data can be labor-intensive, particularly when done manually. Once transformed, however, scaling this data is trivially small: A million people can draw upon this data just as easily as a single person.

¹⁴ See Maura R. Grossman & Gordon V. Cormack, *Technology-Assisted Review in E-Discovery Can Be More Effective and More Efficient Than Exhaustive Manual Review*, 17 RICH. J. L. & TECH. 1 (2018).

¹⁵ Zoe Niesel, *Machine Learning and the New Civil Procedure*, 73 SMU L. REV. 493 (2020)

¹⁶ This example is taken from Blue J Legal, a legal technology start-up for which I am a cofounder. Benjamin Alarie, *The Path of the Law: Towards Legal Singularity*, 66 U. TORONTO L.J. 443 (2016).

NLP, which sits at the intersection of computer science and linguistics, is designed to understand and interpret human language, whether written or spoken. Whereas ML analyzes structured data – that is, that which could be captured in a spreadsheet – NLP is capable of working with unstructured data,¹⁷ such as the text of a memo or an opinion. Both NLP and ML can identify patterns or relationships in data faster and more comprehensively than humans. The relationship can involve individual words, phrases, or even the proximity of words in relation to other words. NLP allows for interpretation beyond words qua words, extending to words in relation to other words, even when those words are not juxtaposed.

NLP already has applications in both the consumer and legal context. For example, firms can use NLP to more effectively evaluate customer feedback across multiple formats – for example, email, surveys, conversations from call centers – to identify recurring or common problems, even as customers express themselves in a myriad of ways.¹⁸ Within law, firms can use NLP to evaluate and identify relevant provisions of a contract and their meaning.¹⁹ This technology is helpful, given the human time, expense, and error that often results when done manually. Even with the promise of comprehending unstructured data, NLP performs better the more structured the text.

15.1.3 *Legal Ethics*

As the number of applications grows, the rate-limiting principle will not be technological, but ethical. It is helpful to distinguish between the ethical and the *legal* ethical considerations of AI. The two overlap but remain distinct. The general ethical debate speaks to the ethical dilemmas that technology poses, which can inform whether the technology should even be built, and if built, how to do it in accordance with ethical considerations. Legal ethics is arguably more restrictive, looking to how the profession uses technology in accordance with its own fiduciary and ethical obligations.

Legal technology raises several ethical concerns.²⁰ One is privacy, the blurring of boundaries of attorney-client privilege. Many of these technologies rest in the cloud,

¹⁷ See Paul D. Callister, *Law, Artificial Intelligence, and Natural Language Processing: A Funny Thing Happened on the Way to My Search Results*, 112 LAW LIBR. J. 161 (2020).

¹⁸ See *Natural Language Processing (NLP)*, SAS, https://www.sas.com/en_ca/insights/analytics/what-is-natural-language-processing-nlp.html.

¹⁹ For a helpful review of natural language processing applications within law, see Robert Dale, *Law and Word Order: NLP in Legal Tech*, 25 NAT. LANGUAGE ENG'G 211 (2018). For recent applications, see, e.g., Fahud ul Hassand & Tuyen Le, *Automated Requirements Identification from Construction Contract Documents Using Natural Language Processing*, J. LEGAL AFFS. & DISP. RESOL. ENG'G & CONSTR. (May 2020).

²⁰ See Axel Walz & Kay Firth-Butterfield, *Implementing Ethics into Artificial Intelligence: A Contribution, from a Legal Perspective, to the Development of an AI Governance Regime*, 18 DUKE L. & TECH. REV. 176 (2019).

and therefore potentially allow third parties illegal access to privileged information. The second is unlawful discrimination when algorithmic tools are used in criminal²¹ and employment contexts. The third is the unauthorized practice of law, particularly as technologies advance and can perform tasks that draw closer to legal advice.²² Finally, the evolution of legal technology raises issues of access to justice, because much of the technology is geared toward the elite private bar, not lawyers who serve regular people.²³ Most practicing lawyers lack these resources.²⁴

15.2 CHALLENGES FOR THE COURTS

Courts face numerous obstacles with respect to technological change. Two obstacles are largely beyond the judiciary's control: caseloads and funding. The remaining three are within the judiciary's scope: judge Luddism, cybersecurity risks, and judicial aversion to public scrutiny. I discuss each in turn.

15.2.1 Caseloads

In a sense, courts perform a reactive role. They adjudicate disputes coming before them, but – save select courts, such as the US Supreme Court – do not control their docket. Nevertheless, the demand on courts continues to grow. Among US district courts, the caseload has grown over the years by 165 percent (from 127,280 cases in 1970 to 337,537 cases in 2017). The caseload demands are arguably even greater than the numbers suggest: Much of this growth involved civil disputes between private parties, which on average take more time to resolve than criminal cases (10.8 months versus 7.0 months in September 2019 in US District Courts, and there has been a

²¹ See *Loomis v. Wisconsin*, 881 N.W.2d 749 (Wis. 2016), cert. denied, 137 S. Ct. 2290 (2017) (holding that judges' use of proprietary software to inform their own bail decisions does not violate a defendant's due process rights). For a discussion of the potential problems raised by proprietary software in the bail context, see Julia Angwin et al., *Machine Bias: There's Software Used across the Country to Predict Future Criminals. And It's Biased against Blacks*, PROPUBLICA (May 23, 2016), <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>.

²² See, e.g., Drew Simsaw, *Ethical Issues in Robo-Lawying: The Need for Guidance on Developing and Using Artificial Intelligence in the Practice of Law*, 70 HASTINGS L.J. 173 (2018).

²³ For example, there is a company called CLOSING FOLDERS, <https://www.closingfolders.com/> that provides a secure, centralized platform in which lawyers can keep track of.

²⁴ Over a third of lawyers are solo practitioners. See CLARA N. CARSON, AM. BAR FOUND., THE LAWYERS STATISTICAL REPORT: THE U.S LEGAL PROFESSION IN 2005 (2005), www.americanbarfoundation.org/uploads/cms/documents/2005_lawyer_statistical_report.pdf. A recent survey revealed that most lawyers, when conducting research, rely on free online resources. See ABA *Profile of the Legal Profession – Technology*, A.B.A., <https://www.abalegalprofile.com/legal-technology/> (describing the ABA's 2020 Legal Technology Survey Report).

relatively consistent discrepancy of increased length for civil cases since at least 2000).²⁵

The growth in caseload necessarily increases demands on the judiciary. The first is on the judges themselves. Among US district courts, the number of authorized judgeships from 1970 to 2017 grew by only 68 percent (from 394 judges to 663 judges).²⁶ Accordingly, judges are tasked with greater responsibilities, particularly after *Iqbal*²⁷ and *Twombly*,²⁸ whose heightened pleading requirements require judges to adjudicate matters earlier in the litigation process. Another is the litigants. Longer periods for a trial date, combined with costs of litigation, increase the likelihood that parties resolve their disputes through trial diminishes. It is a well-known and often repeated maxim that the vast majority of cases resolve prior to trial.²⁹

15.2.2 Funding

As a branch of government, the judiciary is subject to the financial constraints that all public institutions face. In nominal dollars, judiciaries are often spared the budgetary cuts that befall other public services.³⁰ For example, Article III of the US Constitution authorizes Congress to create federal judgeships, but not diminish their salaries. Congress wields the authority to reduce the number of federal judges; it has yet to do so.

In most jurisdictions, salaries constitute the single largest expense of the judiciary budget. Drawing again from the US federal example, salaries (and benefits) from judges, clerks, and staff totalled 64 percent of the FY 2021 total budget request.³¹

²⁵ See *Caseload Statistics Data Tables*, U.S. CTS., <https://www.uscourts.gov/statistics-reports/caseload-statistics-data-tables?m=&pn=33&t=68&m%5Bvalue%5D%5Bmonth%5D=9&y%5Bvalue%5D%5Byear%5D=>; CT. STAT. PROJECT, NAT'L CTR. FOR STATE COURTS, STATE COURT CASELOAD DIGEST: 2017 DATA 2 n.1 (2019) (providing state data, but apparently state civil courts do 99 percent of civil trials); Colleen F. Shanahan, Alyx Mark, Jessica K. Steinberg & Anna E. Carpenter, *COVID, Crisis and Courts*, 99 TEX. L. REV. ONLINE 10 (2020). But maybe all this can go as unrelated to federal courts.

²⁶ See *Caseloads: Criminal Cases, 1870–2017*, FED. JUDICIAL CTR., <https://www.fjc.gov/history/courts/caseloads-criminal-cases-1870-2017>.

²⁷ See *Bell Atlantic Corp. v. Twombly*, 550 U.S. 544 (2007).

²⁸ See *Ashcroft v. Iqbal*, 556 U.S. 662 (2009).

²⁹ The trial rate in federal courts declined from 11.5 percent in 1962 to 1.8 percent in 2002. See Marc Galanter, *The Vanishing Trial: An Examination of Trials and Related Matters in Federal and State Courts*, 1 J. EMPIRICAL LEGAL STUD. 459, 462 (2004); see also Marc Galanter & Mia Cahill, "Most Cases Settle": *Judicial Promotion and Regulation of Settlements*, 46 STAN. L. REV. 1339 (1994).

³⁰ See Robert J. Derocher, *Crisis in the Courts: Bars Take Steps to Stave off Judicial Funding Cuts*, BAR LEADER, May–June 2010.

³¹ See ADMIN. OFF. OF THE U.S. CTS., THE JUDICIARY FISCAL YEAR 2021 CONGRESSIONAL BUDGET SUMMARY (2021), https://www.uscourts.gov/sites/default/files/fy_2021_congressional_budget_summary_o.pdf.

Given a total appropriation of nearly \$6 billion for this year, the federal commitment to salaries is sizable.

At the same time, it is important to consider judicial salaries in a broader context. US district court judges, the most common form of Article III judge, in 2020 earn \$216,400,³² much higher than the US median income,³³ but much less than the elite private bar.³⁴ These pay differentials may deter high-skilled lawyers from joining the bench or, in some instances, encourage departure.³⁵ Moreover, this gap has only grown over time as judicial salaries lag behind the rate of inflation.³⁶ Concurrently, legislatures resist expanding the number of judgeships, resulting in the number of judgeships failing to keep pace with caseload increases.

15.2.3 Judicial Reluctance toward Technology

It is an understatement to say that courts and technology are not the best of friends. Judges, on average, constitute the higher end of the age distribution. Judges typically have distinguished themselves earlier in their career, whether it be in private practice, government, or academia. This process takes time, so it is perhaps no surprise that judges are often in their fifties by the time they join the bench. For example, the average age of an Article III judge at the time of their commission is fifty-one years old. However, given lifetime tenure, most judges remain on the bench well past the traditional retirement age of sixty-five. In 2020, the average age of a district judge was sixty-seven years old and sixty-nine years old for a court of appeals judge.³⁷

Judges, like many older adults,³⁸ may be reluctant to adopt new technologies. Surveys show that among the general population, over 60 percent of Americans aged

³² In 1972, Congress appropriated \$1.2M for the federal judiciary. FED. JUD. CTR., ANNUAL REPORT 1971 (1971), <https://www.fjc.gov/sites/default/files/2012/AnnRep71.pdf>.

³³ The median earnings in 2019 were \$52,000 for full-time, year-round workers. See U.S. CENSUS BUREAU, INCOME AND POVERTY IN THE UNITED STATES: 2019 (2021), <https://www.census.gov/content/dam/Census/library/publications/2020/demo/p60-270.pdf>.

³⁴ See James B. Stewart, *\$11 Million a Year for a Law Partner? Bidding War Grows at Top-Tier Firms*, N.Y. TIMES (Apr. 26, 2018), <https://www.nytimes.com/2018/04/26/business/cravath-kirkland-ellis-partner-poaching.html>.

³⁵ For example, Judge J. Michael Luttig, a prominent federal appellate judge, resigned from the bench to become senior vice president and general counsel of Boeing, attributing the decision in part for an increase in salary. See Neil A. Lewis, *Judge Leaves Appeals Court for Boeing*, N.Y. TIMES (May 11, 2006), <https://www.nytimes.com/2006/05/11/washington/11judge.html>.

³⁶ For example, US district judges in 1970 earned \$40,000 annually, which – adjusting for inflation – would be equal to \$275,664. This amount exceeds the 2020 salary. Albert Yoon, *Love's Labor's Lost – Judicial Tenure among Federal Court Judges, 1945–2000*, 91 CAL. L. REV. 1029, 1032 (2003).

³⁷ See *Biographical Director of Article III Federal Judges, 1789–present*, FED. JUD. CTR., <https://www.fjc.gov/node/7946> (author's analysis of statistics).

³⁸ See Kate Conger & Erin Griffith, *As Life Moves Online, an Older Generation Faces a Digital Divide*, N.Y. TIMES (Mar. 27, 2020), <https://www.nytimes.com/2020/03/27/technology/virus-older-generation-digital-divide.html>.

fifty to sixty-four and nearly 75 percent of those above age sixty-five identify as needing someone else to set up their new electronic devices.³⁹ Other academic studies show that older adults often possess a phobia about technology, particularly when it involves a technology that they did not develop familiarity with during their younger years.⁴⁰

Judges likely share these experiences of the general public. Many judges are years removed from the type of legal work now reliant upon this technology. Either the nature of their work at the time did not demand it or they had junior lawyers who could perform these tasks. On the bench, technology has changed little since the 1980s inception of digital libraries such as Westlaw or LexisNexis. Newer technologies, however, differ categorically from traditional digital search technology by going beyond search to providing answers.

These technologies are in potential tension with an idealization of courts, and judges in particular. Judges, by institutional design, are deemed impartial arbiters of disputes. They are equal to the legislative and executive branches, and are protected against removal without cause. Judges confer with their clerks, or even other judges, but ultimately issue their own decisions, free from any outside influence. Newer technologies challenge the independent role of judges, allowing actors outside the judiciary to influence how judges make decisions. Under this view, judges may cede autonomy. It is one thing for judges to draw upon resources – from clerks, judges, the common law – to inform their view. It is something altogether different for judges to draw upon resources advising them what to do.

15.2.4 Security of Judicial Documents

Another concern for the courts is security of judicial documents. Increasingly, legal technology utilizes cloud computing, hosting applications on remote servers on the web rather than personal computers or local servers. These servers are vulnerable to access by unauthorized third parties. This risk is particularly concerning for the legal profession, where lawyers are ethically bound to maintain strict client confidentiality.⁴¹ These ethics also apply to judges, who similarly must take affirmative steps to avoid disclosing case information outside of the judiciary.⁴²

Client security is a long-standing issue for the legal profession, at the same time co-existent with technology. Before email, lawyers corresponded with clients

³⁹ See Monica Anderson & Andrew Perrin, *Barriers to Adoption and Attitudes towards Tech among Older Americans*, PEW RSCH. CTR. (May 17, 2019), <https://www.pewresearch.org/inter-net/2017/05/17/barriers-to-adoption-and-attitudes-towards-technology/>.

⁴⁰ See Dina Di Giacomo et al., *Psychological Barriers to Digital Living in Older Adults: Computer Anxiety as Predictive Mechanism for Technophobia*, 9 BEHAV. SCIS. (BASEL) 96 (2019).

⁴¹ See MODEL RULES OF PRO. CONDUCT R. 1.6 (Am Bar Ass'n 2020).

⁴² See Stephen G. A. Pitel & Liam Ledgerwood, *Judicial Confidentiality in Canada*, 43 QUEENS L.J. 123 (2017).

through traditional mail or fax. Both had the virtue of being secure, given their person-to-person formats. Email offered the lawyers the promise of instantaneous communication with their clients, while they risked the perils of breaches of client confidentiality, which in many instances could neither be easily remedied nor even traced. The legal profession initially responded by discouraging its use for client communication, but eventually recognized its advantages for facilitating communication between lawyers and clients.⁴³ Today, lawyers widely use email, cognizant of the inherent risks of electronic communication.⁴⁴ Contracts are now routinely finalized on the cloud.⁴⁵

15.2.5 Judicial Aversion to Public Scrutiny

Judges, in contrast to legislators, are public servants who operate predominantly outside of public view.⁴⁶ Whereas trials and certain pre-trial proceedings are open to the public, much of what judges do occurs in private. In contrast to a legislature, judges do not reveal their deliberations, only their final decision in the form of a motion or an opinion. Adding to this opacity, while the disposition judges' decisions are of public record, they are not necessarily readily available. Moreover, judges elect whether to categorize their opinions as *published* or *unpublished*, which further limits their availability.⁴⁷

The public's ability to access federal judicial opinions has historically required lawyers to have access to a physical volume of the federal reporter, or, alternatively, a subscription to an online legal database. In recent years, new media platforms (e.g., Justia) have made federal decisions and statutes publicly available and free of charge. Other public judicial documents, however, remain less accessible.⁴⁸

⁴³ See Catherine Sanders Reach, *10 Email Dos and Don'ts for Lawyers*, N.C. BAR ASS'N (Jan. 7, 2019), <https://www.ncbar.org/2019/01/07/10-email-dos-and-donts-for-lawyers/>.

⁴⁴ See Martha Neil, *Hackers Are Stealing Closing Funds by Intercepting Lawyer-Client Email, Experts Say*, A.B.A. J. (Jan. 11, 2016), https://www.abajournal.com/news/article/hackers_are_stealing_closing_funds_by_intercepting_lawyer_client_email_expe.

⁴⁵ See Sydney Franklin, *Real Estate Transactions Go Virtual*, N.Y. TIMES (Nov. 11, 2020), <https://www.nytimes.com/2020/11/11/realestate/10virtual-deals.html> (describing the emergence of DocuSign as a means to finalize contracts).

⁴⁶ See Arthur S. Miller & D. S. Sastri, *Secrecy and the Supreme Court: On the Need for Piercing the Red Velour Curtain*, 22 BUFF. L. REV. 799 (1973).

⁴⁷ For a discussion of the impact of published versus unpublished opinions, see David C. Vladeck & Mitu Gulati, *Judicial Triage: Reflections on the Debate of Unpublished Opinions*, 62 WASH. & LEE L. REV. 1667 (2005).

⁴⁸ For example, federal docket sheets – which contain the procedural history of filed cases – are available through the Public Access to Court Electronic Records (PACER). This portal, however, imposes a fee of \$0.10 a page, irrespective of whether the user prints or even reads the page, and generates costs even if a search fails to yield a result. See *PACER Pricing: How Fees Work*, PUB. ACCESS TO CT. ELEC. RECS., <https://pacer.uscourts.gov/pacer-pricing-how-fees-work>. In response, Court Listener, part of the Free Law Project, created CourtListener, which offers an Advanced RECAP – PACER spelled backward – search containing millions of

In addition, courts have been loath to link the identities of their judges to their decisions. For example, the Federal Judicial Center makes publicly available data on individual civil and criminal defendant filings and terminations filed in the federal district and appellate courts.⁴⁹ This data, however, omits the judges' identities for each record.⁵⁰ This omission prevents those analyzing the data to observe how differences in case outcomes vary by individual judge.⁵¹

From an academic and policy perspective, knowing which judges decide cases is essential for rigorous statistical analyses. For example, in a recent influential study on the bail decisions, researchers found that state court judges make two types of errors: (1) release defendants on bail who subsequently commit a crime while released and (2) deny bail to defendants who, based on observable characteristics, would have complied with bail conditions if released.⁵² Given the random assignment of cases, researchers could identify when different judges were treating similarly situated defendants differently, and more broadly, the extent to which judges vary from one another.

Other countries worry about public scrutiny of judges. France has outlawed the publication of judge analytics, a crime punishable by up to five years of prison.⁵³ In accordance with the Act, any publication that is likely to undermine the security of any parties to a judicial decision, including judges, must be obscured.⁵⁴ In my own research, I sought to evaluate bail decisions of courts within a Canadian province. The province's judicial council – comprising judges – was willing to release individual-level data on bail proceedings but declined to reveal the identity of judges

PACER documents and dockets, free and open to the public. *Advanced RECAP Search*, CT. LISTENER, <https://www.courtlistener.com/recap/>.

⁴⁹ See *Integrated Database (IDB)*, FED. JUD. CTR., <https://www.fjc.gov/research/idb>.

⁵⁰ The Judicial Conference in 1995 announced a policy “prohibiting the disclosure (except to the extent required by law) of judge-identifying information from statistical databases.” This policy was subsequent reaffirmed by the conference in 1995 and 2003. See FED. JUD. CTR., *THE INTEGRATED DATABASE: A RESEARCH GUIDE 1* n.2 (2020), www.fjc.gov/sites/default/files/IDB-Research-Guide.pdf.

⁵¹ Notably, the judicial conference voted to increase transparency on federal civil proceedings: it rejected a proposal that would have allowed – upon consent of opposing parties to a civil dispute – to automatically seal court records. See Linda Greenhouse, *Judicial Conference Rejects More Secrecy in Civil Court*, N.Y. TIMES (Mar. 15, 1995), <https://www.nytimes.com/1995/03/15/us/judicial-conference-rejects-more-secrecy-in-civil-court.html>.

⁵² See Jon Kleinberg et al., *Human Decisions and Machine Predictions*, 133 Q.J. ECON. 238 (2018).

⁵³ Article 33 of France's Justice Reform Act states, “No personally identifiable data concerning judges or court clerks may be subject to any reuse with the purpose or result of evaluating, analyzing, or predicting their actual or supposed professional practices.” See Loi 2019-222 du 23 mars 2019 de programmation 2018–2022 et de réforme pour la justice [Law 2019-222 of March 23, 2019 on Justice Reform], JOURNAL OFFICIEL DE LA RÉPUBLIQUE FRANÇAISE [J.O.] [OFFICIAL GAZETTE OF FRANCE], Article 33.

⁵⁴ See McCann FitzGerald LLP, *France Bans Analytics of Judges' Decisions*, LEXOLOGY (June 21, 2019), <https://www.lexology.com/library/detail.aspx?g=ff53dfbe-ofe6-4dee-8aid-990bf8459020#:~:text=France%20has%20banned%20certain%20types,or%20predicting%20their%20professional%20practices>.

for each case, on the grounds that it could draw undue criticism of the provincial judges.

Arguments in support of judge anonymity range from distortion of the litigation process to the safety of judges. In 2019, the Constitutional Court of France upheld the constitutionality of the prohibition on revealing judges' identities, determining that court analytics based on individual judges could promote forum shopping, to the detriment of the administration of justice.⁵⁵ In 2020, an individual injured and killed family members of a US district judge, after having appeared before the judge in prior litigation and criticizing her handling of the case on social media.⁵⁶ This followed earlier instances – in 2005,⁵⁷ 1989,⁵⁸ 1988,⁵⁹ and 1979⁶⁰ – where federal judges were killed, all connected to litigants appearing before these judges. The Secretary of the Judicial Conference of the United States testified that identified threats and inappropriate communications directed at federal judges grew from under 1,000 in 2015 to nearly 4,500 in 2019.⁶¹

15.2.6 Litigation as Arms Race

Litigation has long favored those with resources. Litigants with the most resources tend to attract the highest-ability lawyers. At the same time, even sophisticated litigants prefer to trim unnecessary legal expenses. Many legal technology tools allow lawyers to perform legal tasks at a fraction of the time and cost that it took even a decade or two earlier. Thus, there is a segment of the practicing bar that

⁵⁵ See Conseil constitutionnel [CC] [Constitutional Court] decision No. 2019-778DC, July 26, 2019, Rec. 80 (Fr.)

⁵⁶ See Tracey Tully, *Judge Whose Son Was Killed by Misogynistic Lawyer Speaks Out*, N.Y. TIMES (Aug. 3, 2020), <https://www.nytimes.com/2020/08/03/nyregion/esther-salas-roy-den-hollander.html>.

⁵⁷ An out-of-work electrician whose civil case was dismissed by Hon. Joan Humphrey Lefkow (ND-III) killed the judge's husband and mother. See Jodi Wilgoren, *Electrician Says in Suicide Note that He Killed Judge's Family*, N.Y. TIMES (Mar. 11, 2005), www.nytimes.com/2005/03/11/us/electrician-says-in-suicide-note-that-he-killed-judges-family.html.

⁵⁸ A litigant with a case before the Eleventh Circuit Court of Appeals, sitting *en banc*, sent a pipe bomb to the residence of Hon. Robert S. Vance Sr., killing him and gravely injuring his wife. See Alan Blinder, *Alabama Executes Mail Bomber, 83, the Oldest Inmate Put to Death in Modern Era*, N.Y. TIMES (Apr. 19, 2018), <https://www.nytimes.com/2018/04/19/us/alabama-execution-walter-leroy-moody.html>.

⁵⁹ The father of a litigant killed Hon. Richard J. Daronco (SD-NY) in the aftermath of the judge dismissing the litigant's case. See Robert D. McFadden, *Federal Judge Slain by a Gunman in Westchester*, N.Y. TIMES (May 22, 1988), <https://www.nytimes.com/1988/05/22/nyregion/federal-judge-slain-by-a-gunman-in-westchester.html>.

⁶⁰ A defendant from an organized crime family arranged the assassination of Hon. John H. Wood, Jr. (WD-TX). See Wayne King, *3 Are Found Guilty in Assassination of Federal Judge*, N.Y. TIMES (Dec. 15, 1982), <https://www.nytimes.com/1982/12/15/us/3-are-found-guilty-in-assassination-of-federal-judge.html>.

⁶¹ See *Judiciary Steps Up Calls to Enact Security Measures*, U.S. CTS. (Sept. 22, 2020), <https://www.uscourts.gov/news/2020/09/22/judiciary-steps-calls-enact-security-measures>.

embraces legal technology to improve both the efficiency and quality of their practice. On the other end of the spectrum, many lawyers represent litigants of more modest means. Given the nature of their practice and their own limited resources, these lawyers are slower to incorporate these technologies.

Judges are not exempt from this competition. This asymmetry of legal sophistication threatens our civil and criminal justice system. This imbalance might be more palatable if litigation involved only parties of comparable means: that is, affluent litigants filing suit against affluent litigants; poor litigants filing suit against poor litigants. While this phenomenon occurs in certain situations – for example, intellectual property and corporate disputes typically involve well-financed litigants⁶² – many instances reflect a more David-versus-Goliath disparity, such as personal injury, immigration, or civil rights. This imbalance may distort legal outcomes at trial, if lawyers financed by well-resourced litigants can generate outcomes that maximize chances of prevailing or, if that is not possible, ameliorating the terms of an unfavorable outcome. These decisions, in turn, affect both the manner and terms under which subsequent litigants resolve their disputes, irrespective of whether they proceed to trial.⁶³

The courts' lack of technological sophistication also poses risks to our civil and criminal justice system. In terms of resources, courts fall somewhere between well-financed and modestly financed litigants. They certainly possess more resources – technological as well as labor – than the typical lawyer, but are increasingly falling behind the elite bar, typically those practicing at the largest law firms. Legal technology is transforming how the elite bar practices. In contrast, legal technology has had a modest effect on the judiciary. While existing developments are welcome – for example, judges increasingly allow litigants to electronically file their court documents – the courts' earlier adaptation to technology suggests a slow transition.

15.3 A PATH FORWARD

Legal technology presents both opportunities and challenges for the legal profession. It transforms the way that lawyers practice. For much of the profession's existence, all legal tasks, however mundane, were the exclusive domain of lawyers. Even as paralegals have taken on tasks, legal work remained the domain of humans. New technologies enable machines to assist lawyers in increasingly more of their legal tasks. As a result, for example, discovery can take a few hours of one lawyer's time rather than weeks requiring several lawyers. And finding answers to discrete legal questions can now take a few minutes rather than a few hours.

⁶² See Richard A. Posner & Albert H. Yoon, *What Judges Think of the Quality of Legal Representation*, 63 *STAN. L. REV.* 317 (2010).

⁶³ Robert H. Mnookin & Lewis Komhauser, *Bargaining in the Shadow of the Law: The Case of Divorce*, 88 *YALE L.J.* (1978).

As with many new technologies, adoption of legal technology lags behind availability. Adoption among lawyers depends in large part on cost and value. Technologies that enable lawyers to improve both the quality and rate at which they work encourage broader adoption. Society is replete with examples of wide-scale technological adoption, both with respect to hardware (e.g., personal computers, smartphones) and software (Facebook; Twitter). Even when the costs of adoption are considerable, the costs of eschewing these technologies are arguably higher.⁶⁴

While the legal profession is still in its early stages of adoption of legal technology, the profession recognizes the need for lawyers to develop and maintain a level of technical competence. The American Bar Association now includes technological competence in its model rules.⁶⁵ Courts have been slower than the profession to adopt technological change, for the aforementioned reasons. The path forward involves two parts, which I discuss in turn.

15.3.1 *Greater Technological Competence in the Judiciary*

At first blush, this competence may appear unnecessary. Very few cases result in a trial. Among civil cases filed in district court in the period 1970 through 2019, fewer than 3 percent of filed civil cases ended in a verdict.⁶⁶ Given this relatively low percentage, one can argue that judges have ample time to properly adjudicate the cases before them, without additional technology. Looking only at trial outcomes, however, provides an incomplete picture of the integral role that judges have in helping parties resolve their disputes. Based on civil filings in federal district court, parties resolved disputes on their own in roughly half the cases, without court adjudication. But in nearly a quarter of all cases, judges adjudicated the dispute, prior to trial, on procedural – for example, lack of jurisdiction – or substantive – for example, summary judgment, affirming findings of an arbitrator or magistrate judge – grounds.⁶⁷ This data provides evidence that, at a minimum, judges play an active role in helping many parties resolve

⁶⁴ For example, in the United States in 2019, 96 percent of Americans owned a cell phone and 81 percent owned a smartphone. *Mobile Fact Sheet*, PEW RSCH. CTR. (June 12, 2019), www.pewresearch.org/internet/fact-sheet/mobile/.

⁶⁵ See MODEL RULES OF PRO. CONDUCT R. 1.1 ¶ 8 (AM. BAR. ASS'N 2020) (“[T]o maintain the requisite knowledge and skill, a lawyer should keep abreast of changes in the law and its practice, including the benefits and risks associated with relevant technology.”).

⁶⁶ Data taken from analysis of Federal Judicial Center data of federal court decisions, as analyzed by the author. The data is available at *Integrated Database (IDB)*.

⁶⁷ See Tracey E. George & Albert Yoon, *Visible Trial: Judicial Assessment as Adjudication*, forthcoming, 94 *Colorado Law Review* __ (2022).

their disputes. Even when parties do not proceed to trial, they take guidance from judges during the pre-trial phase.

The judiciary's response to the COVID-19 pandemic provides optimism that judges may be more open to technology than originally perceived. In the United States, every state has initiated online hearings in response to the pandemic.⁶⁸ In addition, a majority of states allow litigants to electronically file court documents.⁶⁹ In many respects, these transformations reflect the judiciary's adopting well-established processes within the practicing bar.

These changes also provide second-order changes that are just as beneficial, namely democratizing the litigation process by increasing its access. Online hearings and electronic filing allow litigants to advance their claims without having to miss time off from work or find childcare. Even as the pandemic brought about curfews and shelter-in-place ordinances, courts reported a dramatic drop in failure-to-appear rates for civil and criminal proceedings.⁷⁰

It will be interesting to see how courts respond when governments – at all levels – lift restrictions as COVID-19 moves from a pandemic to an endemic state. Will courts revert to their traditional practices that rely heavily on in-person interaction, or will they make a permanent transition to using technology to reduce the transaction costs of litigating? While judicial adaption of technological has its bumps,⁷¹ its benefits, on balance, outweigh the growing pains.

Judges can and should make greater use of legal technology. While some obstacles to adoption may be budgetary, judicial norms likely play a larger role. As with most matters, judges exercise considerable discretion as to how they use technology in their courtroom. As more judges become comfortable with technology, and advocate for its use, judicial norms will evolve toward using legal technology as yet another resource at their disposal. A New York Supreme Court justice in support of using technology recently commented, “Judges should have some knowledge of the technology If [judges] have the knowledge . . . it makes the case more efficient.”⁷²

⁶⁸ See Eric Scigliano, *Zoom Court Is Changing How Justice Is Served*, THE ATLANTIC (Apr. 13, 2021), <https://www.theatlantic.com/magazine/archive/2021/05/can-justice-be-served-on-zoom/618392>.

⁶⁹ See *id.*

⁷⁰ See *How Courts Embraced Technology, Met the Pandemic Challenge, and Revolutionized Their Operations*, PEW TRS. (Dec. 1, 2021), <https://www.pewtrusts.org/en/research-and-analysis/reports/2021/12/how-courts-embraced-technology-met-the-pandemic-challenge-and-revolutionized-their-operations>.

⁷¹ See David Horigan, *COVID Technology Law Update: The Law of Virtual Court Proceedings*, LAW.COM (Feb. 8, 2022), <https://www.law.com/legaltechnews/2022/02/08/covid-technology-law-update-the-law-of-virtual-court-proceedings/> (describing issues of virtual courtroom etiquette).

⁷² See Ryhs Dipshan, *As Remote Proceedings Continue, Judges' Tech Knowledge Becomes Even More Critical*, LAW.COM (Mar. 10, 2022), <https://www.law.com/legaltechnews/2022/03/10/as-remote-proceedings-continue-judges-tech-knowledge-become-even-more-critical/>.

15.3.2 *Wide Availability of Judicial Data*

Using technology to increase access to justice is an important step, but only a partial solution. As discussed throughout the chapter, the available legal technologies go far beyond access and search. The next frontier of legal technology will be tools that assist lawyers in their tasks that involve discretion and judgment. Imagine a system where lawyers can, early on, have a comprehensive understanding of the client's legal issues, the factors most likely to determine success, and a probabilistic assessment of the litigation outcome. Of course, a good lawyer is capable of doing all of this, but it involves a fair amount of time. The emergence of legal technology allows the lawyer to achieve these objectives more efficiently, more accurately, and at less expense to their clients.

Development of this legal technology requires greater access to judicial materials. Most judicial documents – for example, opinions, orders, motions - are deemed public documents but are often difficult and costly to access. Courts can make these materials more readily available, most easily through their own webpages. Just as importantly, courts can encourage great use of these documents by the public, by making them available in electronic format (rather than as an image or pdf). Doing so saves third parties the time and expense of digitizing the documents and focuses on developing legal analytic tools.

Litigants, in turn, could use these analytic tools to make more informed choices about their legal disputes. Many litigants already do this: Sophisticated litigants – often through their lawyers – effectively evaluate the merits of their dispute, and choose the appropriate path. Less sophisticated litigants, however, often lack the resources to make this same determination. Analytic tools can help litigants more accurately evaluate their claim: for example, whether they have a legal claim, whether their legal claim is supported by statute or precedent, and even how a court might rule.

Litigants, by better understanding the legal dimensions of their disputes, could collectively change the distribution of case filings. In this reformulation, parties could resolve disputes where precedent points to a clear resolution, allowing courts to focus on disputes where either

- (1) parties agree on the facts and for which the existing precedent fails to produce a clear result or
- (2) parties disagree on the facts, such that they lead to divergent outcomes as a matter of law.

Academia and private sector researchers analyzing judicial data can have a symbiotic effect on one another to better understand the litigation, the judiciary, the legal profession, and the common law itself. Some research may be of interest primarily to academics or to the private sector. In many instances, however, research will generate interest among both groups, and push each other to develop tools that satisfy the rigor of their respective markets.

In addition to making judicial opinions widely accessible, courts can also release information about other judicial documents, such as motions and orders. As with opinions, orders are public in nature, but often difficult for the public to access, depending on the jurisdiction. This data is useful as a means of evaluating the courts' performance in both civil and criminal matters, both procedurally and potentially substantively. For example, judicial research has revealed that judges are most likely to deliver a favorable ruling to plaintiffs shortly after they had eaten.⁷³ A large-scale study revealed that judges routinely committed both Type 1 and Type 2 errors with respect to pretrial bail determinations.⁷⁴ These academic studies were made possible only because courts shared their data.⁷⁵

While this chapter has focused on the promise of legal technology of judges, there are reasons to exercise caution. Judges, more than litigants, must be sensitive to constitutional considerations of technology as it relates to privacy, discrimination, and access to the courts. Not every technology will be applicable to the courts, and even those that are may prove problematic. In addition, logistical issues abound, in part because of the decentralized nature of courts, both across and within jurisdictions, which impedes data availability.⁷⁶ Lastly, judicial governance of technology is highly complex, for which scholars provide conceptual frameworks.⁷⁷ Ultimately, courts should neither delegate their authority to legal technology nor eschew it altogether. Rather, like much of the elite practicing bar today, courts can use this technology as a tool to inform their own independent decisions.⁷⁸

15.4. CONCLUSION

This chapter embraces the potential virtue of legal technology to improve systemic access-to-justice challenges. The idea of using data to better understand the law is

⁷³ See Shai Danziger, Jonathan Levav & Liora Avnaim-Pesso, *Extraneous Factors in Judicial Decisions*, 108 PROC. NAT'L ACAD. SCI. 6889 (2011).

⁷⁴ See Jon Kleinberg et al., *Human Decisions and Machine Predictions*, 133 Q. J. ECON. 237 (2017).

⁷⁵ See Sean Rehaag, *Judicial Review of Refugee Determinations: The Luck of the Draw?* (Compar. Rsch. in L. & Pol. Econ., Research Paper No. 9/2012, 2012), <http://digitalcommons.osgoode.yorku.ca/clpe/7>.

⁷⁶ For a description of these challenges, see Eleni Panagou & Manolis Vavalis, *Toward an Open and Decentralized Case Law Curation Ecosystem*, 15 PLOS ONE e0240041 (2020).

⁷⁷ See, e.g., David F. Engstrom & R. J. Vogt, *The New Judicial Governance: Courts, Data, and the Future of Civil Justice*, 71 DEPAUL L. REV. (forthcoming 2023).

⁷⁸ See *State v. Loomis*, 881 N.W.2d 749 (Wis. 2016) (stating that courts should use an algorithmic tool to determine bail risk only if they have the capacity for effectively evaluating the tool's efficacy).

itself well established. Back in 1897, Oliver Wendell Holmes famously wrote, “For the rational study of the law the black-letter man may be the man of the present, but the man of the future is the man of statistics and the master of economics.”⁷⁹ In this respect, the recent developments in legal technology are simply fulfilling Holmes’ prophesy. The judiciary can and should play an active role in this progression.

⁷⁹ Oliver Wendell Holmes, *The Path of the Law*, 10 HARV. L. REV. 457, 469 (1897).