PART I

Introduction to Legal Informatics

1.1

Motivation and Rationale for this Book

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From document review in litigation, to compliance, case prediction, billing, negotiation and settlement, contracting, patent management, due diligence, legal research, and beyond, technology is transforming the production of legal work and in turn the economics of the legal industry. Legal informatics is the academic discipline that underlies many of these transformational technologies, and despite all of these technical advances, no modern comprehensive treatment of the field has been offered to date. With contributions from more than two dozen academic and industry experts, this book offers readers a first-of-its-kind introductory overview of the exciting field of legal informatics.

While technology is not new to law, previous rounds of technology adoption by lawyers have largely been driven by technologies that are more generally applicable to all knowledge workers (e.g., the use of word processing, email, smartphones, cloud computing, etc.). Excitingly, many of the current innovations in legal technology are actually retrofitted to the specific work that lawyers undertake.

The design of this new generation of legal technology is increasingly built on and linked to the field of legal informatics. Across a wide range of substantive examples, readers will be exposed to both the theoretical and applied challenges that underlie the field. Although the book is aimed at those with limited technical knowledge, we hope it will encourage readers to seek additional technical skills. We also hope that the book will assist an emerging class of engineers – legal technologists – in applying their technical skills to the field of law with an understanding of underlying legal requirements.

In addition to being an aid to law and/or technology practitioners, this book is also meant to serve as a textbook for teaching legal informatics. A new book of this breadth and depth cannot feasibly be written by one or two individuals. The dozens of expert contributors necessary imply a complexity among and between chapters. There is an inevitable redundancy of material (e.g., defining precision and recall). To some degree, we left in some of the repetition in order to allow for the atomicity of individual chapters. This gives more freedom to instructors to select chapters that fit their focus and expertise, be it breadth or depth. Any book such as this that discusses modern technology is almost inevitably somewhat out of date before it is published. That being said, our goal was to explain underlying concepts such that the timeliness of the examples is not crucial.

It is our hope to see the development of US graduate programs and associated degrees at all levels in legal informatics, similar to medical informatics programs, up to and including PhD programs. We also hope to see, increasingly, appropriate career

paths for legal technologists whose value is recognized as central to modern strategic planning and business models, system design and integration, and creative problem solving, on par with any senior-level professional. As we emphasize throughout the text, the importance of an understanding of both law and technology for a modern legal system cannot be overstated.

1.2

Technology Issues in Legal Philosophy

Ron Dolin

I INTRODUCTION: TECHNOLOGICAL IMPLEMENTATION OF LAW

"How do these techniques of policy inform the practice of policy makers?"

Lawrence Lessig, *Code* 2.0

The *philosophy of law* is the study of the nature of law: What is law? What are the criteria of a functioning legal system? What is the relationship between law and morality? A course on legal technology and legal informatics focuses on the *technological* implementation of a legal system. As we move away from static, printed documents toward virtual, distributed, integrated systems, software ("code") plays an increasingly important role in the legal system. Obviously code has applications far beyond implementing law. Yet, as Lawrence Lessig points out in *Code* 2.0, non-law code also regulates behavior, often in a more fundamental way than laws do.[1] As discussed in this chapter, code is architectural in nature and effectively limits behavior similarly to laws of physics. Only in science fiction do we entertain the notion of faster-than-light travel, perpetual motion, or evading gravitational forces. Similarly, we tend to accept the limitations of code that prevent us from, say, lending out our e-books, though such lending would certainly be legal. Even if we are aware of these limits and do not like them, most of us have no capacity to change them. As far as our behavior is concerned, code may as well be the law.[2]

This increase in the role of software calls into question the manner in which fundamental legal functions such as the interpretation, enforcement, and creation of rules are moving beyond the institutions traditionally established to implement them. This raises issues such as which groups, following which norms, are regulating our behavior. The ability to block legal behavior in order to prevent potentially illegal behavior also raises the issue of whether software *ought* to allow us to act *illegally* because we have either the custom or the right, at times, to do so – whether to jaywalk, to speed, or to act in civil disobedience. Where technology changes the nature of preventive possibilities, we have to take another look at the balance between prevention and punishment to regulate behavior.

[1] Lawrence Lessig, *Code* 2.0 (New York, NY: Basic Books, 2006), available at: http://codev2.cc.

[2] *Ibid.* Lessig's *Code* 2.0 is referenced repeatedly throughout this chapter, in part because it highlights the necessity of dealing with some of the philosophical issues related to legal technology. In addition, many of Lessig's points will be more readily available to readers of a legal informatics survey course if they are more succinctly presented. The reader is encouraged to seek the original source.

A complementary perspective on law that derives from legal informatics is looking at the logic, structure, data, and measurement of law. Formulas are not new to law – anyone who has studied torts has encountered the negligence calculation by Judge Learned Hand, commonly written as B = PL, which dates back to 1947.[3] The economics of law, empirical legal studies, and even investigations of AI and the law, go back several decades. An informatics approach to law, as in other fields such as medicine, looks at law through the lens of data flow. Which types of data structures and algorithms might be associated not only with legal documents and legal information, but also with courts, legislation, law firms, or policing, in general? How might we quantify, analyze, and predict legal quality and outcomes, and how might we measure the accuracy of these quantifications? Finally, what might be the proper boundaries for the applications of automation in the legal system, and what are the trade-offs between efficiency, quality, access, and fairness that impact our decisions?

At first blush, some of these questions might be seen as no more basic than any policy issue arising in any substantive law course. But as millions of disputes are handled automatically, as increasingly complex problems are handled algorithmically, and as AI assists *pro se* litigants, document review, and settlement negotiations via estimates of outcomes, the law is increasingly being handed over to machines based on quantitative analyses. Whether we consider standard philosophical themes such as the rule of recognition and the role of institutions, or new questions related to the proper role of machines in regulating human-to-human interactions, technology increasingly impacts law at the philosophical level. Ronald Dworkin stated that law "is defined by attitude, not territory or power or process."[4] In legal informatics, it is not clear where, or in what manner, that attitude resides.

This chapter is not intended to be a comprehensive study of all the topics it touches. Instead, it is an effort to introduce the reader to the relationship between legal technology and philosophy. It also serves to introduce many common themes across legal technology within a framework of the legal system, rather than through a technology orientation.

II LEGAL INSTITUTIONS, EFFECTIVENESS, AND TECHNOLOGICAL DISRUPTION

"Many, if not all, legal philosophers have agreed that one of the defining features of law is that it is an institutionalized legal system."

Joseph Raz, *The Institutional Nature of Law*

Institutions are a defining component of a mature legal system.[5] They are "'stable, valued, recurring patterns of behavior'. As structures or mechanisms of social order, they govern the behaviour of a set of individuals within a given community. Institutions are identified with a social purpose, transcending individuals and intentions by mediating the rules that govern living behavior."[6]

Modern society allocates the role of interpretation, enforcement, and creation of law to associated institutions – typically the judiciary, police, and legislature, respectively. For various reasons addressed throughout this chapter, the issue of the *effectiveness* of the

[3] *United States v. Carroll Towing Co.*, 159 F.2d 169 (2d Cir. 1947) ("if the probability be called P; the injury, L; and the burden, B; liability depends upon whether B is less than L multiplied by P: *i.e.*, whether B > PL").
[4] Ronald Dworkin, *Law's Empire* (Cambridge, MA: Harvard University Press, 1986), pp. 413, 470.
[5] Joseph Raz, "The Institutional Nature of Law," *The Modern Law Review* 38 (5) (1975): 489–503.
[6] "Institution," *Wikipedia*, available at https://en.wikipedia.org/wiki/Institution (accessed June 9, 2020).

implementation of a legal system surfaces repeatedly. This point was raised as a fundamental assumption by Joseph Raz in defining legal systems:

> "We are familiar with the distinction between legal systems which are in force in a certain society and those which are not. There is a legal system in force now in Great Britain and there is one in force in Norway. But the legal system once in force in the Roman Republic is no longer in force, nor is the legal system proposed by a group of scholars for country X in fact in force in that country. Whether or not a system is in force in a society depends on its impact on the behaviour of people in the society. The precise nature of the criterion determining if a system is in force is a disputed issue with which I will not be concerned. But whatever it is, it concerns the attitudes and responses of all or certain sections in the society to the legal system: Do they know it, do they respect it, obey it? etc. This seems to me to be a very significant fact . . . A legal system exists if and only if it is in force. The significance of the point is that it brings out that normative systems are existing legal systems because of their impact on the behaviour of individuals, because of their role in the organisation of social life. Consequently when we look at legal systems as systems of laws, when we consider their content and disregard the question of whether they are in fact in force, whether they exist, we should look for those features which enable them to fulfil a distinctive role in society. These will be the features which distinguish legal systems from other normative systems."[7]

Therefore, as we review the intended role of basic legal institutions, we also need to examine their effectiveness. Technology has a complex impact on legal implementation. On the one hand, it may serve to sustain institutions when it enables them to function more efficiently (though doing so may come at a societal cost). On the other hand, technology may serve as a disruptive force as it increasingly regulates behavior outside the legal system, potentially more quickly than the legal system is able to accommodate.[8] The rate of change of technology tends to increase, while the rate of change of the legal system tends to get bogged down by its increasing complexity.

The central theme of technological disruption as applied here is that systems tend to cater to higher ends of a market, leaving behind the lower end; the ability to handle the complexity at the high end comes with a burden of cost and inefficiency that the lower end cannot afford and does not require. This leaves an opening for the displacement of the status quo with a more efficient model that only needs to address the lesser needs at the lower end. Over time, the new model grows in sophistication and moves upmarket, all the while maintaining the higher levels of efficiency.

A Defining an Effective Legal System

In identifying or defining legal systems, not all institutions are equally determinative. In particular, a necessary requirement of "municipal legal systems" is that they contain "primary norm-applying organs":

[7] Raz, "The Institutional Nature of Law," *supra* note 5 at 489–490.

[8] For a full discussion of the notion of the sustaining and disruptive impacts of technology, *see* Clayton M. Christensen, *Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (Cambridge, MA: Harvard Business Review Press, 1997). This book is discussed at length in Chapter 4.1 – Adaptive Innovation: The Innovator's Dilemma in Big Law, *infra*. The disruption described here is more of the "adaptive" nature, as legal systems are more likely to transform than to go away. By definition, whatever serves the purpose of defining and applying societal norms, while maintaining supremacy over other systems, *is* the legal system.

> "the type of institutions we are looking for are those which combine norm-making and norm-applying in a special way. Let us call these institutions primary (norm-applying) organs, to indicate their importance . . . They are institutions with power to determine the normative situation of specified individuals, which are required to exercise these powers by applying existing norms, but whose decisions are binding even when wrong."[9]

In other words, the institution of the judiciary is perhaps the key component of a legal system.

Raz addresses the issue of the uniqueness of a legal system as compared to any other normative system and arrives at several requirements. It is a *necessary* feature of all legal systems (1) that they contain norms *establishing primary institutions*; (2) that a law belongs to them only if the primary institutions are under a *duty* to apply it; and (3) that primary institutions have *limits to discretion* set by the norms.[10] In addition to these necessary conditions, he identifies three *sufficient* conditions that define a legal system. Legal systems are: (1) *comprehensive*, in that they may regulate any type of behavior; (2) *supreme*, in that they have precedence over all other normative systems available to its citizenry; and (3) *open*, in that they enforce external rules, such as conflicts of laws, contracts, and corporate bylaws.[11]

If we analyze these requirements *without* the presumption of effectiveness, however, several of them are problematic in their implementation in many modern legal systems. As is common in disruption, systems, values, and procedures develop around certain presumptions that, while perhaps true originally, become less so over time. For example, assumptions about caseloads, per capita resources, legal complexity, and technological capability have not remained static. Many implementation methodologies are no longer justifiable in the face of the inefficiencies they create and their inability to scale. However, a move toward efficiency usually impacts quality – sometimes for the better, but sometimes not.

B *Interpretation and Application*

How effective is the judiciary, the institution responsible for legal interpretation and application? American courts, for example, are increasingly overloaded and backlogged, leading to severe access to justice (A2J) issues across a range of problems for literally millions of people annually. Civil litigants involved in common disputes such as family law, consumer debt, and property law are often forced to represent themselves, usually poorly, due to a lack of personal and societal resources.[12] In criminal law, public defenders are vastly overloaded.[13] In addition, commercial, online transactions are often cross-jurisdictional or international, involving small monetary amounts, and result in millions of disputes annually – almost exclusively handled outside any court system.

One result of this excessive caseload has been a push for, and increase in, online dispute resolution (ODR) systems that automate as much of the dispute resolution process as

9 Raz, "The Institutional Nature of Law," *supra* note 5 at 493–494.
10 *Id.* at 499.
11 *Id.* at 500–502.
12 *See* Staudt and Rabanal – Access to Justice and Technology: Reaching a Greater Future for Legal Aid, *infra*.
13 *See, e.g.*, Alexa van Brunt, "Poor People Rely on Public Defenders Who Are Too Overworked to Defend Them," *Guardian*, June 17, 2015, available at: www.theguardian.com/commentisfree/2015/jun/17/poor-rely-public-defenders-too-overworked; Laurence A. Benner, "Eliminating Public Defender Workloads," *Criminal Justice* 26 (2) (2011), available at: www.americanbar.org/content/dam/aba/publications/criminal_justice_magazine/cjsu11_benner.authcheckdam.pdf.

possible, both domestically and internationally.[14] Even under the assumption that ODR systems are high quality (which many certainly are), they are not a panacea for all the problems facing the traditional legal system institutional model:

1. ODR is usually outside courts – as in ADR – and lacks many of the attributes associated with a judicial system.
2. ODR within courts needs to address automation issues (see below).
3. There is an ecosystem of barriers to the adoption of efficient solutions, such as a desire to protect the profession (another institution)[15] and the bureaucracy of the judiciary.[16]
4. There are problems for which there are no known norms.

Many people's actual experience with the judiciary is quite lacking in access or quality. A norm-applying institution cannot be said to fulfill the requirements of a legal system model if norms are so frequently not applied in case after case, and the system is so inefficient that it becomes increasingly ineffective. However, a technological approach such as ODR, while addressing the efficiency issue, also needs to maintain quality of outcomes. Judicial institutions do not mechanically apply norms to facts:

> "legal systems consist of laws which the courts are bound to apply and are not at liberty to disregard whenever they find their application undesirable, all things considered. It does not follow that the courts are to be regarded as computing machines, always applying pre-existing rules regardless of their own views of which rules or which decisions are the right ones. But it does follow that they are to apply a certain body of laws regardless of their views on its merits and are allowed to act on their own views only to the extent that this is allowed by those laws."[17]

Judges have a duty to apply the law, and though they have some discretion, that discretion is limited by law. This raises the question of the ability of automated systems to fulfill this function (to whatever degree possible). From a technology perspective, the problem is not that judges *are not* mechanical, but rather the assumption that computers necessarily *are* mechanical. This is perhaps an overly simplistic notion of software.[18] Some existing systems use game theory and transparent applications of algorithms to assist with settlement and mediation negotiations. Current technology solutions used for A2J and consumer law, utilizing varying degrees of expert systems and other AI, focus on triage. A sophisticated algorithm for ODR should be able to assess whether it should defer to a human adjudicator. The point is that computer-based dispute resolution systems exist, are growing in sophistication, and are orders of magnitude more efficient than the status quo.

Efficiency risks a decline in quality, a risk that courts are loath to accept. For example, the US Supreme Court has addressed the issue of whether criminal sentencing guidelines,

[14] *See* Orr and Rule – Online Dispute Resolution, *infra*. As one of many examples of courts adopting an ODR framework, the UK is moving lower-value claims online; *see* The Civil Justice Council, "Online Dispute Resolution: For Low Value Civil Claims," 2015, available at: www.judiciary.gov.uk/wp-content/uploads/2015/02/Online-Dispute-Resolution-Final-Web-Version1.pdf.

[15] See Dolin – Measuring Legal Quality, section on "Access to Justice: UPL vs. Technology," *infra*.

[16] *See*, *e.g.*, Ron Dolin, "Feedback on Technology Governance, Strategy, and Funding Proposal: Executive Summary for California Judicial Branch," Slide Presentation, June 16, 2014, available at: www.slideshare.net/RonDolin/court-report.

[17] Raz, "The Institutional Nature of Law," *supra* note 5, at 497.

[18] A humorous, yet insightful, analysis of the issues of machine free will and robotic judges is given in "Free Will Hunting," *Futurama*, Season 7, Episode 9, Comedy Central, 2012.

a formulaic, efficient approach to consistency, can or should be mandatory.[19] They found that the factual elements of a crime used to extend a sentence beyond the guidelines must be found to be true by a jury, beyond a reasonable doubt, and that such a requirement can be met only if the guidelines are advisory rather than mandatory. In weighing the balance of efficiency with quality (in this case, fairness), the Court found that quality takes precedence, at least where the stakes are sufficiently high. Of course, when the cost of acting fairly means frequently not acting at all in many cases due to an overburdened institution, courts are squeezed – limiting their effectiveness one way or the other.

At the end of the day, as we increase efficiency and move toward automation, we need to measure both procedural and outcome fairness to retain the effective application of norms within the institution of the judiciary.

C *Enforcement*

While institutions that apply norms to disputes may be the key defining characteristic of municipal legal systems, institutions for enforcing norms are also necessary.[20] Regulation through law's exercise of power is institutionalized through mechanisms such as a police force. Similar to applying the law, *efficient* enforcement comes with risks. As an example, consider predictive policing:

> "Predictive policing tries to harness the power of information, geospatial technologies and evidence-based intervention models to reduce crime and improve public safety. This two-pronged approach – applying advanced analytics to various data sets, in conjunction with intervention models – can move law enforcement from reacting to crimes into the realm of predicting what and where something is likely to happen and deploying resources accordingly."[21]

Unconditionally accurate prediction is possible only for systems that are "well-isolated, stationary, and recurrent (like our solar system). Such systems are quite rare in nature, and human society is most emphatically not one of them."[22] Prediction is never an exact science, and predictive algorithms draw conclusions based on the input of prior patterns.[23] One potential downside of predictive policing is a predisposition to suspicion, in part because the technology can be used to predict not just where and when crimes may occur, but *who* may commit them, imperfectly.[24] Also, where similar technology may influence estimates of

[19] A string of cases from 2000 to 2007 concluded that, although sentencing guidelines may be presumed to be reasonable, they may not be considered mandatory. The findings of facts related to the details of how a crime was committed and the character of the perpetrator are inputs to the guidelines, and require the "beyond reasonable doubt" standard – that is, a jury. See *Apprendi v. New Jersey*, 530 U.S. 466 (2000) (the jury-trial right "has never been efficient; but it has always been free."); *Ring v. Arizona*, 536 U.S. 584 (2002); *Blakely v. Washington*, 542 U.S. 296 (2004); *United States v. Booker*, 543 U.S. 220 (2005) (mandatory guidelines inconsistent with jury trial, as required); *Rita v. United States*, 551 U.S. 338 (2007) (guidelines presumed reasonable).

[20] Raz, "The Institutional Nature of Law," *supra* note 5, at 493: "There is no doubt that norm-enforcing institutions play an important role in all modern legal systems." The article proposes that a society in which enforcement is handled privately rather than institutionally, once a dispute has been discharged by the norm-applying institution, would still be considered to have a legal system. Although that might be true in theory, no examples are given, as one might imagine.

[21] National Institute of Justice, "Predictive Policing," available at: www.nij.gov/topics/law-enforcement/strategies/predictive-policing/Pages/welcome.aspx.

[22] Stanford Encyclopedia of Philosophy, "Karl Popper," November 13, 1997, available at: https://plato.stanford.edu/entries/popper/#ScieKnowHistPred.

[23] *See* Katz – AI + Law: An Overview, *infra*.

[24] www.washingtonpost.com/local/public-safety/police-are-using-software-to-predict-crime-is-it-a-holy-grail-or-biased-against-minorities/2016/11/17/525a6649-0472-440a-aae1-b283aa8e5de8_story.html.