


# Defining legal technology and its implications

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## ABSTRACT

Legal technological developments have been both lauded as the promising future of the law and derided as a danger to the fundamentals of justice. This article helps reconcile these divergent perspectives by providing a definition of legal technology and a framework through which to understand its different types and their potential implications for the legal system and society more generally. Mapping technologies according to how specifically they afford legal uses, and the directness with which they engage in unmediated legal activities reveals different technological categories and their differing propensities to have legal, functional or general implications. This framework can help inform discussions both about which types of legal technologies to be excited about, and which to be concerned about, while also helping guide research, policymaking, design and adoption considerations.

**KEYWORDS:** legal technology, technology and society, affordances theory

## INTRODUCTION

Although excitement about how technology will change the practice or substance of law is nothing new,<sup>1</sup> recent years have witnessed rapid growth in both the development and marketing of legal technologies, and discussions about their implications.<sup>2</sup> The increasing sophistication of these technologies and their wider availability and adoption have generated two divergent narratives about their potential implications. These narratives alternately express excitement about legal technology's potential to make the law more efficient and improve access to justice,<sup>3</sup> or concern about the

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- 1 See eg, Louis H Mayo, 'New Technology and National Goals Some Implications for Legal-Policy Decision Making' (1961–1962) 37 Notre Dame Law Rev 33; Marise Cremona and Adam Hodgkin, 'Electronic Publishing in Law: A Text-Base Approach' (1989) 9 Oxf J Leg Stud 323.
- 2 See Roger Brownsword, *Law 3.0: Rules, Regulation, and Technology* (Routledge 2020); Jim Leason, Abigail Connor and Jimmy Vestbirk, 'Legaltech Startup Report 2019: A Maturing Market' (2019) <<https://blogs.thomsonreuters.com/legal-uk/2019/10/18/a-new-report-legaltech-startup-report-2019-a-maturing-market/>> accessed 27 August 2020; In recent years, investments in legal tech firms have exceeded \$1 billion Meg McEvoy, 'ANALYSIS: 2019 Legal Tech Investments Top \$1B After Strong Q3' (*Bloomberg Legal Analysis*, 11 October 2019) <<https://news.bloomberglaw.com/bloomberg-law-analysis/analysis-2019-legal-tech-investments-top-1b-after-strong-q3>> accessed 24 September 2020.
- 3 Andrew Arruda, 'An Ethical Obligation to Use Artificial Intelligence? An Examination of the Use of Artificial Intelligence in Law and the Model Rules of Professional Responsibility' (2017) 40 Am J Trial Advoc 443; John O McGinnis and Russell G Pearce, 'The Great Disruption: How Machine Intelligence Will Transform the

ways in which it may actually exacerbate existing biases or otherwise systematically harm justice.<sup>4</sup> Although these two narratives appear to be at odds with one another, they can be reconciled by noting one simple and uncontroversial fact about legal technologies: they are diverse. However, despite their diversity, we lack a sufficiently precise and nuanced conceptualization to differentiate between the varied types of legal technology. To the extent that we currently have a vocabulary to categorize these technologies, it relies on the areas of law they are applied in. So, legal tech comprised ‘fintech, regtech’,<sup>5</sup> ‘smart contract’,<sup>6</sup> ‘e-discovery’,<sup>7</sup> etc. While this categorization tells us something about where or when a technology might be used, it overlooks all of the other dimensions these technologies can be sorted along as well as the similarities they share. At other times, scholars or commentators might examine legal tech by focusing on how specific technologies might be applied to the law. For instance, scholars have written about how technologies like search engines,<sup>8</sup> machine learning<sup>9</sup> or chatbots<sup>10</sup> might influence the law or legal practice. However, by focusing on specific types of technology these approaches offer little to help us make sense of legal technology as a whole. This lack of precision in commentary relating to legal technologies makes deep and meaningful discussion about their merits and demerits less precise than they should be. By more explicitly defining and categorizing legal technologies, this article seeks to help address this lack of precision.

The relationship between law and technology is much older than recent decades and includes much more than the computationally enabled information technologies often used as examples. For instance, important technological developments like writing,<sup>11</sup> papermaking<sup>12</sup> and citator organization<sup>13</sup> influenced the development of

Role of Lawyers in the Delivery of Legal Services’ (2013–2014) 82 *Fordham L Rev* 3041; Richard Susskind, *Tomorrow’s Lawyers: An Introduction to Your Future* (Oxford University Press 2013).

- 4 Mireille Hildebrandt, ‘Law as Computation in the Era of Artificial Legal Intelligence: Speaking Law to the Power of Statistics’ (2018) 68 *UTLJ* 12; Frank Pasquale, ‘A Rule of Persons, Not Machines: The Limits of Legal Automation’ (2019) 87 *Geo Wash L Rev* 1.
- 5 Douglas W Arner, Janos Barberis and Ross P Buckley, ‘FinTech, RegTech, and the Reconceptualization of Financial Regulation’ (2016–2017) 37 *Northwest J Intl L & Bus* 371.
- 6 Eliza Mik, ‘Smart Contracts: Terminology, Technical Limitations and Real World Complexity’ (2017) 9 *LIT* 269; Max Raskin, ‘The Law and Legality of Smart Contracts’ (2017) 1 *Geo L Tech Rev* 305; Pierluigi Cuccuru, ‘Beyond Bitcoin: An Early Overview on Smart Contracts’ (2017) 25 *Int J Law Inf Technol* 179.
- 7 Maura R Grossman and Gordon V Cormack, ‘Technology-Assisted Review in E-Discovery Can Be More Effective and More Efficient than Exhaustive Manual Review Annual Survey’ (2010–2011) 17 *Rich J L & Tech* 1.
- 8 Robert C Berring, ‘Legal Research and Legal Concepts: Where Form Molds Substance’ (1987) 75 *Cal L Rev* 15; Robert C Berring, ‘Chaos, Cyberspace and Tradition: Legal Information Transmogrified’ (1997) 12 *Berkeley Tech LJ* 189.
- 9 Harry Surden, ‘Machine Learning and Law’ (2014) 89 *Wash L Rev* 87; McGinnis and Pearce (n 3); Paul Gowder, ‘Is Legal Cognition Computational? (When Will DeepVehicle Replace Judge Hercules?)’ in Ryan Whalen (ed), *Computational Legal Studies* (Edward Elgar Publishing 2020).
- 10 Joshua D Blank and Leigh Osofsky, ‘Automated Legal Guidance’ (2020) 106 *Cornell L Rev* 179.
- 11 Richard A Posner, ‘A Theory of Primitive Society, with Special Reference to Law’ (1980) 23 *J L Econ* 1 (discussing the relationship between writing and legal system development).
- 12 Richard Leslie Hills, *Papermaking in Britain 1488–1988: A Short History* (Bloomsbury Publishing 2015) 130 (referring to the importance of papermaking for legal document keeping).
- 13 Robert C Berring, ‘Legal Research and the World of Thinkable Thoughts’ (2000) 2 *J App Prac Process* 305; Berring, *Legal Research and Legal Concepts* (n 8) (exploring the relationship between citator development and legal categorization).

law and legal systems, and were each in different ways ‘legal’ technologies. The basket of technologies referred to as ‘legal tech’ is vast, and its constituent technologies vary in their design, their markets, their implications and the directness with which they engage with the law. Noting this diversity and identifying the important dimensions along which legal tech varies, can provide both a better understanding of what it means to be legal technology, as well as guidance about the potential implications and relevant design considerations they raise.

This article makes three contributions to the way we understand, study and discuss legal technologies. First, it offers a definition of legal technology as ‘all devices, capable of being used as a means for interacting with the substance of law or assisting its user to interact with the law, and the skills and techniques by which we use them’. Next, it situates those technologies within a two-dimensional mapping according to the directness with which they engage with the law and the extent to which they specifically afford legally related uses. Following from this mapping, and informed by the resulting taxonomy of legal technologies it provides, this Article then goes on to discuss the implications that legal technologies can give rise to and how these can and should inform the design, regulation and adoption of legal tech. Before we move on to mapping legal technologies and trying to understand the different types of implications they can have, we must first discuss what we mean when we talk about ‘legal tech’.

#### A DEFINITION OF LEGAL TECHNOLOGY

On the surface, the notion of ‘legal technology’ and what may or may not fall under its auspices, seems straight forward. One might say that legal technology is simply any technology that one might use while engaged in legal activities. However, this definition has a number of weaknesses. It is of course self-referential, defining the term in relation to its component parts. It also elides much of the nuance and diversity that exist within the bounds of legal technology, while at the same time being over inclusive and possibly incorporating many mundane technologies that have no intrinsic ‘legalness’ about them.

Because of the diversity of technologies that potentially fit within the ‘legal tech’ penumbra, scholars have struggled to produce a precise and concise definition of it. Webb defines legal technology as ‘the use of digital information and communication technologies to automate all or part of the legal work process, to offer decision support to legal service producers, and to provide legal information and advice directly to clients/end users.’<sup>14</sup> Hoffmann-Reim offers a similar definition describing legal tech as ‘the use of digital technologies to assist in identifying, interpreting and applying the law and, in some instances, also in creating it.’<sup>15</sup> Salmerón-Manzano focuses on legal tech as online services used by lawyers or those needing legal advice.<sup>16</sup> These are certainly helpful definitions, but they exclude many non-digital precursors

14 Julian Webb, ‘Legal Technology: The Great Disruption?’ in Richard L Abel and others (eds), *Lawyers in 21st Century Societies* (vol II, Hart Publishing 2021).

15 Wolfgang Hoffmann-Riem, ‘Legal Technology/Computational Law’ (2021) 1 J Cross-disciplinary Res Computational L.

16 Esther Salmerón-Manzano, ‘Legaltech and Lawtech: Global Perspectives, Challenges, and Opportunities’ (2021) 10 MDPI J Laws 24.

of modern legal technologies. This is perhaps appropriate when discussing 21st century legal technologies but is unduly limiting when trying to understand the concept more generally.<sup>17</sup>

Rather than focusing on precisely defining legal technologies, Gowder provides a helpful way to categorize them according to the type of effect they have on legal practice.<sup>18</sup> This categorization scheme sorts legal technologies into two types: the ‘cheaper lawyer’ type which replicates current practices but with greater efficiency, and the ‘transformative artificial legal cognition’ type that facilitates automated legal decision-making in ways not previously possible. This focus on how different legal technologies have different implications for legal systems provides an essential consideration for related discussion. However, we are still left without a clear definition of what precisely we mean when we talk about ‘legal tech’. In seeking a generally applicable and historically inclusive definition, we can begin by deconstructing the term into its constituent parts—legal and technology.

### What is it to be ‘legal’?

To be ‘legal’ is of course to be ‘relating to the law’.<sup>19</sup> Although there is jurisprudential disagreement about what precisely the ‘law’ is, for our present purposes these philosophical disputes can largely be ignored. Provided we adopt a sufficiently expansive definition, little will turn on its precise philosophical perspective. Shapiro’s definition of legal activities as those that are ‘shared, official, institutional, compulsory, [and] self-certifying’ acts of social planning with a moral aim<sup>20</sup> provides one such sufficient definition of law and legality. These acts result in social plans, which can manifest as rules, regulations, norms, common law principles, etc that make up what we commonly think of as ‘the law’. So, to be a ‘legal’ technology is to be a technology related to one of these social plans or the resulting system of shared, official, institutional and compulsory rules, norms, etc.<sup>21</sup>

In order to avoid an overbroad definition of the ‘legal’ portion of legal technology, we must also account for the nature of the relationship between the technology and the law. Not all technologies relating to anything that law touches upon will be ‘legal technologies’. This would subsume all technologies and make the ‘legal’ modifier meaningless. Rather, we must include limit legal technologies to be those that

17 The trade press offers another source of definitions of legal technology, but they are often circular and of limited help in delineating the concept, including ones such as ‘the technology that helps facilitate the practice of law’ Christian Lang, ‘What Is “Legal Tech”?’ (*Medium*, 3 November 2018) <<https://medium.com/@christianlang/what-is-legal-tech-a6edf69140e7>> accessed 24 September 2020, or ‘the use of technology and software to provide and aid legal services’ ‘What Is Legal Technology And How Is It Changing Our Industry?’ (*The Lawyer Portal*, 29 January 2019) <<https://www.thelawyerportal.com/blog/what-is-legal-tech-and-how-is-it-changing-industry/>> accessed 24 September 2020.

18 Paul Gowder, ‘Transformative Legal Technology and the Rule of Law’ [2018] UTLJ <<https://www.utpjournals.press/doi/abs/10.3138/utlj.2017-0047>> accessed 22 June 2020.

19 ‘legal, adj. and n.’ OED Online, OUP, March 2021 <[www.oed.com/view/Entry/107008](http://www.oed.com/view/Entry/107008)> accessed 25 April 2021.

20 Scott Shapiro, *Legality* (Harvard University Press 2011) 3111.

21 Under this definition, the law can of course take many forms—eg, as an explicit rule, a common law standard, a plan-like norm, etc—however the ‘rule’ is perhaps the modern archetype of law and as such I will at times use ‘legal rules’ below to speak of law. See Antonin Scalia, ‘The Rule of Law as a Law of Rules’ (1989) 56 U Chi L Rev 1175.

'interact with' the law as such. That is to say, those technologies that interact with the substance of law itself—for instance the rules, norms, principles, etc—or the activities involved in discovering, creating, enforcing or complying with that legal substance. To return to Shapiro's definition of law as social planning, technologies that engage with the law as such would include those that help form the plans, determine what the plans are or gauge whether activities conform to the plan.

Because of both law's omnipresence and technology's diversity, there are of course many ways that technologies can interact with the law. In the categorization of legal technologies below, I will detail some of these different ways and the important dimensions along which they vary. For now, let it suffice to say that if a technology is capable of interacting with the substance of law, or assisting its user to interact with the law, it is 'legal'. With that addressed, let us now turn to shedding some light on precisely what we mean by 'technology'.

### What is technology

Much as defining 'what is legal' is the subject of a vast and varied literature, the task of attempting to define 'technology' has a similarly robust tradition. Although engaging deeply with this tradition is beyond our current scope, defining legal technology requires at least some discussion of what it means to be a technology.

Technology has at its roots two Greek words: *techne* (craftsmanship, craft or art) and *logos* (word, reason, discourse, etc). Since the industrial revolution, the term has been remarkably fluid, having shifted in meaning from the study of craft and technical production to refer to the objects produced themselves.<sup>22</sup> The dictionary definition of the modern term is often something along the lines of 'machinery, equipment, etc, developed from the practical application of scientific and technical knowledge'.<sup>23</sup> With its focus on machinery and equipment, this more traditional definition characterizes technology as artefact, thereby overlooking its non-physical aspects. Sociologists of science and technology offer a more inclusive definition, such as Bain's 'all tools, machines, utensils, weapons, instruments, housing, clothing, communicating and transporting devices and the skills by which we produce and use them'.<sup>24</sup>

Although helpful, Bain's definition is also perhaps overly detailed, listing some terms redundantly (eg, a tool is also potentially a utensil and an instrument), and can be made more succinct. What Heidegger refers to as the instrumental definition of technology as a 'means to an end' helps in this regard by focusing on the ways technologies can be and are used as a vital aspect of the definition.<sup>25</sup> To ensure our definition is clearly inclusive of information technologies, which are so central to legal tech,<sup>26</sup> we can also include a reference to the 'technique' involved in using devices. This helps ensure that a computer clearly fits within the definition of technology but so too does a type of database or machine learning model. Putting these

22 Eric Schatzberg, "'Technik' Comes to America: Changing Meanings of "Technology" before 1930" (2006) 47 *Tech & Cult* 486.

23 'technology, n.' OED Online, OUP, March 2021 <[www.oed.com/view/Entry/198469](http://www.oed.com/view/Entry/198469)> accessed 25 April 2021.

24 Read Bain, 'Technology and State Government' (1937) 2 *Am Soc Rev* 860, 860.

25 Martin Heidegger, *The Question Concerning Technology, and Other Essays* (Garland Publishing 1977) 4.

26 Richard E Susskind, *The Future of Law: Facing the Challenges of Information Technology* (OUP 1996).

components together gives us a useful working definition of technology as: ‘all devices capable of being used as a means to human ends and the skills and techniques by which we produce and use them.’

### Defining legal technology

We can adapt this general definition of technology to provide one that is focused specifically on legal technologies. Doing so leads us to a definition of legal tech as: ‘all devices, capable of being used as a means for interacting with the substance of law or assisting its user to interact with the law, and the skills and techniques by which we use them.’ This encompasses all technologies that are capable of being used towards ‘legal ends’.

This is an expansive definition, and will include many different types of technologies. Indeed, as technologies become more capable of taking on legally related roles, it will come to include more-and-more different types of technology.<sup>27</sup> The next section helps divide these technologies into their different types by characterizing them according to both their possible uses and the degree to which they directly engage with the law.

#### A MAPPING AND CATEGORIZATION OF LEGAL TECHNOLOGY

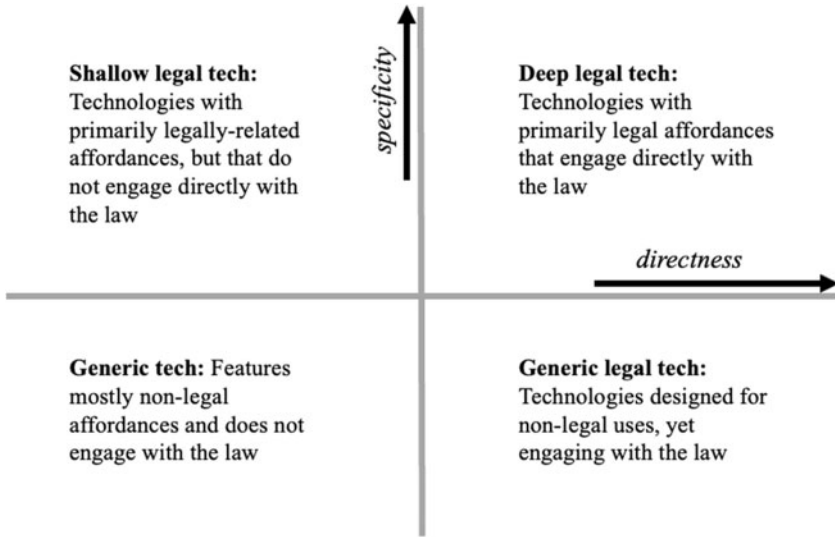
The definition of legal technologies as those capable of use as a means to interact with the law is expansive, incorporating a wide variety of technologies. To facilitate a useful mapping of these technologies that allows us to understand their different types in terms that extends beyond their practice area applications, I propose situating them along two dimensions: their legal ‘directness’, and their legal ‘specificity’. Legal directness refers to the extent to which a technology interacts with the law in a direct unmediated fashion. Specificity refers to how generic or specifically useful the technology in question is. Assessing legal technologies along these two dimensions provides a mapping of four different types of technology (Figure 1).

The ‘specificity’ dimension runs from generic technologies with many non-legal applications, to more specific technologies that are designed for or capable of being applied for primarily legally related purposes. While this may seem simple on its face, it is important to note that a technology’s ‘uses’ are not merely coterminous with its ‘capabilities’. Technologies are often used in ways for which they were not designed or intended, and users may or may not avail themselves of each of a technology’s capabilities. The ways technologies are used vary greatly by context, they change over time, differ between users and are thus difficult to define in specific and concrete ways.

The concept of technological ‘affordances’<sup>28</sup> provides a way to discuss legal technologies’ capabilities, while also recognizing the complex and socially constructed nature of their actual or perceived uses and potential. Building on Gibson’s

27 For more on the increasing technologization of the law (as Law 3.0), see Brownsword (n 2); Roger Brownsword and Han Somsen, ‘Law, Innovation and Technology: Fast Forward to 2021’ (2021) 13 *Law Innov Technol* 1.

28 James J Gibson, *The Ecological Approach to Visual Perception* (Houghton Mifflin 1979); Ian Hutchby, ‘Technologies, Texts and Affordances’ (2001) 35 *Sociology* 441; William W Gaver, ‘Technology Affordances’, *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (ACM 1991).



**Figure 1.** Mapping legal technologies according to their ‘directness’ (how directly they engage with the law in an unmediated and/or official manner) and their ‘specificity’ (the degree to which they offer primarily legal affordances). Although useful for visualization purposes, these two dimensions are not truly orthogonal to one another, and do not bisect one another quite as neatly as shown. In reality, the ‘generic tech’ quadrant would occupy only a small corner on the bottom left. These technologies do not interact with the law directly or indirectly. Once a technology is capable of interacting with the law, even if in a quite mediated and indirect manner, it becomes ‘legal’ technology and thus the ‘generic legal tech’ quadrant would occupy much of the lower half of the space.

introduction of the notion of affordances to the cognitive psychology literature,<sup>29</sup> scholars of science and technology<sup>30</sup> and design<sup>31</sup> have adopted it to more precisely discuss how technologies can be and are used. Hutchby defines technological affordances as ‘the possibilities that [technologies] offer for action’.<sup>32</sup> Affordances describe all the functional capabilities that a technology has. Take for instance a paperback book. It has a wide variety of affordances including conveying a narrative story, weighing down papers in a windy office, swatting houseflies, etc. While these affordances are properties of the book, whether they are available depends on the context. When the book is perceived by someone not literate in its language, its narrative-conveying affordance is not available, yet it retains its capacity as a paper-weight (Figure 2).

All of this is to say that legal technologies also have affordances, and those sets of affordances vary in terms of how exclusively legal they are. The specificity dimension

29 Gibson *ibid.*

30 See eg, Paul M Leonardi, ‘When Does Technology Use Enable Network Change in Organizations? A Comparative Study of Feature Use and Shared Affordances’ (2013) 37 MIS Q 749; Hutchby (n 28).

31 See eg, Donald A Norman, *The Psychology of Everyday Things* (Basic Books 1988); Rex Hartson, ‘Cognitive, Physical, Sensory, and Functional Affordances in Interaction Design’ (2003) 22 Behav Info Tech 315.

32 Hutchby (n 28) 447.



**Figure 2.** The specificity dimension varies based on how generic or specifically legal a technology’s affordances are.

reflects this and represents the degree to which a technology has a specifically legal or more generic set of affordances. Sometimes the availability of those affordances will depend on context, such as whether the user is a layperson, a legal professional or someone serving in an official capacity, but regardless the affordances are there. Legal technologies with low specificity—that is to say generic technologies—may have legal affordances but also many non-legal ones. They can be applied to the law or legal practice, but they can also be used for unrelated purposes. For instance, the word processing software I am currently using is a generic technology. It can be used to engage with the law, but it is not primarily intended for such use and it has many non-legal uses. On the other end of the spectrum would be a technology with a very specific set of legal affordances, and few non-legally related ones. For example, an automated contract clause generator has almost exclusively legally related affordances.

The ‘directness’ dimension also relates to the affordances that a technology offers, but rather than focusing on how varied those affordances are it measures the degree to which a technology affords direct engagement with the law. There are two aspects of a technology that can affect this directness—the extent to which it requires a human intermediary to interact with the law and whether that interaction is official. Thus, directness spans a spectrum from technologies which are highly indirect, because they do not themselves refer directly to any legal substance and require an intermediary to do so, to those that engage with the substance of the law directly and officially. In a sense, this directness dimension can be thought of as representing not just the degree to which the technology in question can be used for legal ‘ends’, but the degree to which it does so by legal ‘means’ (Figure 3).

For example, consider different technologies all related to speed limit enforcement or compliance. The regular speedometer installed in a car is highly indirect. It functions to help ensure the driver’s behaviour complies with the law and thus fits our definition of a legal technology, but it requires extensive human intermediation to do so. The human driver needs to be aware of the local speed limit, to compare that with the speedometer’s readings and subsequently perhaps correct the vehicle’s



**Figure 3.** The directness spectrum runs from highly indirect engagement with the law to direct and official engagement.



speed. The police officer's radar gun still requires a human intermediary, but it is calibrated and officially endorsed as a measure of vehicle speed, making its engagement with the law more direct than the unofficial driver's speedometer. Finally, the speed camera requires no intermediary and engages directly and officially with the law by automating enforcement and issuing speeding tickets where appropriate. It is thus a very direct example of this type of technology.

These two dimensions—directness and specificity—are related but distinct. Technologies that are inherently very direct in nature—that is to say, those that incorporate or engage with legal rules directly and officially as a core part of their functionality—will often be specifically designed for legally related uses and thus have a set of affordances that is largely legally related. That said, this relationship runs from directness-to-specificity, but not necessarily in the other direction. There are many technologies that are specifically designed for use in legal practice that may not engage with legal rules at all and are thus relatively low in their directness. Consider a law firm's contract precedent management system. It is specifically designed for legal uses by helping the firm track and reuse or adapt contractual provisions, but because the substance of legal rules does not feature in the design or use of the tool, it is not directly legal in nature.

Although there are of course many dimensions along which one can sort legal technologies, these two are particularly useful in providing a categorization that is distinct from the 'field of practice' categorizing approach that is presently dominant, and in doing so they help provide insight into the potential wider social, professional and legal implications arising from these technologies. Focusing on how 'direct' a legal technology is in its interface with the law represents the degree to which it automates behaviour that would otherwise require a human to complete. In doing so it can help distinguish between technologies that introduce great potential change to legal practice or enforcement. Technologies that are highly indirect and require extensive human intermediation between them and the law are *ceteris paribus* less concerning than those that potentially remove human intermediaries and engage directly with the law, potentially automating important legal tasks. Meanwhile, the specificity dimension can provide insight into the degree to which the technology in question is of general relevance—and thus perhaps best subject to general regulation—or whether it is more narrowly relevant to legal officials and practitioners—and thus perhaps more appropriately regulated via professional bodies or the courts.

The four quadrants of the directness–specificity space can be used to categorize technologies into types. In the low specificity, low directness quadrant, we find generic technologies. These are of little interest to our present purposes, as they neither afford legal uses nor do they engage with the law. The quadrant above generic technology represents the high specificity, low directness technologies that can be thought of as 'shallow legal tech'. These technologies are designed for and afford uses that primarily relate to the law, but they do not engage meaningfully with the law as such. The bottom right quadrant, featuring the low specificity and high directness technologies, is home to 'generic legal tech'. Like their generic neighbours to the left, they are not designed with specific legal uses in mind, but they can engage directly with the law. Finally, the top right corner of the space shows the high specificity and high directness technologies. These 'deep legal technologies' both afford primarily legally related uses and engage with the law directly and deeply. The

following sections will further describe these types of technologies, before we turn to examining the different implications they can have.

### Generic technologies

Generic technologies are those that do not engage with the law—or only do so in such a remote and indirect way as to have essentially no engagement—and have a generic (ie, non-legally related) set of affordances. This category includes the majority of technologies—from the curtains on my windows to the powerplant charging my laptop. Although these technologies are clearly important, they are beyond this article's immediate scope and so will only be discussed in passing. What distinguishes these technologies from their generic legal technology counterparts is that they are as low on the directness spectrum as to have essentially no connection, or only an extremely attenuated connection, to the law and legal practice.

It is true that because the law touches on all human activities, generic technologies can, and often do, have implications for the law and legal practice. As such, they will appear in discussions about technological implications below. However, for the time being, our focus is on 'legal' technologies, and so we will turn first to the three other types of categories that are either used as the means to a legal end or that afford primarily legal uses.

### Generic legal technologies

Generic technologies that have some degree of engagement with the law are perhaps 'legal technologies' but as a group are the furthest removed from the law and legal practice. They have a generic—as opposed to specifically legal—set of affordances, and because they are generic, they come in a wide variety of forms, including those that have only mediated and indirect engagement with the substance of the law and those that are more direct. For instance, this category includes all sorts of mundane and indirectly legal technologies like computers, highlighters or the Internet. These are generic technologies, in that they offer a widely varied set of affordances, and only engage with the law via extensive human intermediation. On the other hand, some generic technologies offer more direct legal engagement. Consider for example the self-driving car.<sup>33</sup> Its primary set of affordances are things like transportation, shelter, etc and it is thus on the generic side of the generic-specific spectrum. However, it also engages directly with the substance of the law, it features databases of legal rules and makes unmediated determinations about compliance.

Not all generic technologies are generic 'legal' technologies. The bicycle that the lawyer rides to work, or the shoes that she wears during her visit to the court are so far left on the 'directness' spectrum that they are simply 'generic'. To be a generic 'legal' technology, the technology in question must be capable of being applied to the professional or personal practice of law, or it must engage with legal rules, codes or norms. That is to say, they afford legal uses.

33 Anthony J Casey and Anthony Niblett, 'Self-Driving Laws' (2016) 66 UTLJ 429.

### Shallow legal tech

Moving on from generic technologies with some legal affordances, we come next to the technologies that are specifically legal because their affordances are primarily legally related, yet do not themselves engage directly with the law. These technologies are frequently used to engage with some aspect of legal practice—for instance, helping a practitioner discover the law or track legal developments—and thus are often used by lawyers, judges, law librarians and others who frequently engage in legal practice. Because they are designed with legally related uses in mind, they are high in ‘specificity’; however, they do not engage directly with the law and are thus low in ‘directness’.

Because so much of legal practice revolves around determining what the law is in relation to some scenario, many of the technologies specifically designed to assist in legal practice are meant to help in this process of legal search and retrieval. For instance, the many legal databases that catalogue and organize the law in its various forms fit within this category. These databases are designed to help lawyers, judges, clerks and others who might want to know what law governs some issue they have identified. Other examples of specific legal practice technologies include things like docket management systems used by courts, contract management systems used by corporations or patent prior art search engines. It is a broad category—including many information technologies—that continues to grow in its importance to the legal profession.

Much of the shallow legal tech category is populated by generic technologies that have been adapted specifically for legal use. This reflects the recombinatorial nature of technology, where technological developments are variously recombined and repurposed to produce new variants.<sup>34</sup> For instance, technologies like the docket management systems or legal opinion search engines referenced above are adaptations of generic database and information retrieval systems that have been specifically designed for legal applications.

What distinguishes these shallow legal technologies from their more deeply legal counterparts is their comparatively limited direct engagement with the law. For instance, while the precedent search engine may be very specifically designed for legal uses, and indeed a key part of many legal practices, it does not engage with the law as such. It makes no legal determinations and leaves the majority of the legal work to the human practitioner. Recently, more technologies have been moving beyond this dynamic by engaging more directly with the law as such, and by automating more legal work.

### Deep legal tech

Atop the legal technology hierarchy are those technologies that afford primarily legal uses and that engage directly and deeply with the law. These technologies do so by making legal determinations, directly or indirectly enforcing the law, or perhaps by updating the law itself. Some might consider these ‘true’ legal tech because they are

34 Charles Galunic and Simon Rodan, ‘Resource Recombinations in the Firm: Knowledge Structures and the Potential for Schumpeterian Innovation’ (1998) 19 *Strategic Mgmt J* 1993; Martin L Weitzman, ‘Recombinant Growth’ (1998) 113 *QJ Econ* 331.

so closely entwined with the law. Much of the recent excitement about legal technologies revolves around the promise of deep legal tech to transform the institution of the law or the way we interact with it.<sup>35</sup>

Despite their direct legal engagement, these technologies need not be overly complex, and some of them have been widely used for many decades. For instance, tax preparation software that takes as input one's specific circumstances—eg, income, marital status, etc—and makes a determination about one's tax obligations fits into this deep legal tech category. These programmes are designed to take into account the relevant tax law, and by comparing a set of facts to that law make legal determinations. When these technologies are official in nature and thus capable of making legally binding determinations about tax obligations, they become even more directly legal as they further reduce the need for human intermediation between the facts and the legal outcome. Other examples of deep legal tech include newer inventions like the so-called 'smart contracts' that are designed to monitor conditions and self-execute as the agreement dictates,<sup>36</sup> or automated trademark infringement detectors that use artificial intelligence to monitor IP portfolios and make judgements as to possible infringement.<sup>37</sup>

At the apex of this 'deep legal technology' category are technologies—at this point mostly theoretical—that not only incorporate the rules into their engineering and make legal determinations, but that observe conditions and update the rules accordingly. These technologies offer much promise in addressing some of the weaknesses inherent in the way law is created, but also raise important ethical issues about the role of law and its legitimacy.

Although these technologies are at this point largely theoretical, we can imagine some examples. For instance, responsive speed limits provide a simple example of this sort of reactive legal technology.<sup>38</sup> By monitoring traffic congestion and updating local speed limits in order to help ensure safe traffic flow, automatic speed limiting technologies are not just taking rules and facts as input and giving legal interpretations as output, but rather are updating the current rules that govern behaviour.

In some ways, this theoretical type of legal technology engages in making law. Unlike the other types of legal tech which either assist in legal practice, or help one discover or interpret the law, these 'law making technologies' actually alter the rules that govern behaviour at any given time and can be empowered to dynamically alter legal obligations. For this reason, they have particularly powerful implications and correspondingly important design considerations.

35 See eg, McGinnis and Pearce (n 3); Sophia Adams Bhatti, Akber Dattoo and Drago Indjic, *The LegalTech Book: The Legal Technology Handbook for Investors, Entrepreneurs and FinTech Visionaries* (John Wiley & Sons 2020); Micha-Manuel Bues and Emilio Matthaei, 'LegalTech on the Rise: Technology Changes Legal Work Behaviours, But Does Not Replace Its Profession', *Liquid Legal* (Springer 2017); Arruda (n 3).

36 Raskin (n 6); Cuccuru (n 6).

37 Sonia K Katyal and Aniket Kesari, 'Trademark Search, Artificial Intelligence, and the Role of the Private Sector' (2021) 35 *Berkeley Tech L J* 501.

38 See John O McGinnis, *Accelerating Democracy: Transforming Governance through Technology* (Reprint edition, Princeton University Press 2015).

## IMPLICATIONS OF LEGAL TECHNOLOGIES

Having spent all of this time and effort defining and mapping legal technology, it would be very understandable if one were to ask: ‘why?’ Why does it matter that the rather amorphous set of technologies sometimes referred to as ‘legal tech’ can be sorted along these two dimensions of their generic utility and the directness with which they engage with the law? Does the categorization that this sorting allows for provide more than a helpful ‘sense-making’ explication of legal technologies?

I believe the answer to these questions is that yes, identifying these dimensions along which we can situate legal technologies provides nuance that is useful when we discuss them. And, perhaps more importantly, thinking of legal technologies in this way provides insight into the varied concerns different types of legal technology raise in terms of their implications and the design and regulatory issues that they give rise to.

Before moving on to discuss these potential implications, it is important to note that the effects legal technologies might have are not simply a function of their capabilities but are also influenced by important social forces. There is a tendency in the literature to take an overly technologically deterministic approach in forecasting how legal tech will alter legal practice and legal systems more generally.<sup>39</sup> Deterministic accounts of technology equate technological progress with social progress and make assumptions based on a technology’s capabilities to infer how it will be adopted and what sorts of implications it will have.<sup>40</sup> In doing so, these accounts ignore the role of human agency both in the choices contributing to a technology’s design, and also in terms of how that technology will go on to be used. In reality, technology is not merely deterministic but is—at least in part—a social construct, and as such any discussion of its implications must account for its social context. To do so, technology can be considered not merely as a tool with inherent capacities that will become manifest as it is used, but rather as an entity which offers a variety of technological affordances that users may or may not avail themselves of.<sup>41</sup> Doing so reveals that, although technologies may have inherent affordances, they are also subject to human agency and are thus ‘both shaped by and shaping of the practices humans use in interaction with, around and through them’.<sup>42</sup> Conceiving of technological development and its implications as not merely deterministic, but rather as a function of both technology’s affordances and a degree of social construction that is constrained by those affordances, helps ensure a more realistic and nuanced understanding of the relationship between technology and society.

The relationship of legal technology to the law and legal practice has yet another consideration that must be accounted for—the limitations and possibilities within different jurisdictions.<sup>43</sup> For legal technologies, we can think of these as ‘legal

39 See Milan Markovic, ‘Rise of the Robot Lawyers’ (2019) 61 *Ariz L Rev* 325 (arguing that more nuance is needed to address existing deterministic accounts of legal technology’s future).

40 Sally Wyatt, ‘Technological Determinism Is Dead; Long Live Technological Determinism’ in Edward J Hackett and others (eds), *The Handbook of Science and Technology Studies* (vol 3, MIT Press 2008).

41 Gibson (n 28); Gaver (n 28); Norman (n 31).

42 Hutchby (n 28) 444.

43 This is similar to how a technology’s institutional or organizational context can have far-reaching effects for its affordances and the way they are or are not adopted by its users. Anne-Laure Fayard and John Weeks, ‘Affordances for Practice’ (2014) 24 *Info Org* 236.

affordances' which can limit or enable the affordances of legal technology. From a jurisdictionally agnostic perspective, a legal technology might have a given set of affordances. However, that set of affordances can change dramatically in practice if that technology is regulated by a jurisdiction's legal profession or laws. For instance, consider again our example of the automated speed limit enforcement camera. In theory, it affords direct enforcement of the law. However, these cameras are not legal in all jurisdictions.<sup>44</sup> In jurisdictions where their use is not legal, they have no legal affordance to enforce the law and may in fact be completely irrelevant. Thus, when considering what sorts of implications a specific legal technology might have, in addition to considering its inherent affordances, one must also consider the legal affordances in relevant jurisdictions.

To summarize, legal technologies' implications are not deterministic. Rather, they are influenced by the affordances each technology might allow for, the choices made by users as they adopt (or ignore) each technology, and the legal affordances of the jurisdictions within which they might be used. All that said, these implications can be sorted roughly into three types and the likelihood of any given technology having implications of these varied types is related to its directness and specificity, as described above. In order to show how mapping legal technology along these two axes can help reveal design, adoption and regulation considerations, let us first explore three distinct types of implications that legal technologies can have: legal, functional and general.

### Legal implications

Perhaps, the most obvious type of implication arising from the adoption of a new legal technology is the possibility that it alters the substance of the law. This occurs when the technology in question affects the form of some legal rule, norm, principle, etc. For instance, the responsive speed limit technology discussed above enables jurisdictions to reform comparatively crude speed limits tied only to the location of the road in question, or perhaps one or two other auxiliary inputs like the time of day or proximity to a school, with tailored speed limits that optimize traffic flow across an entire network of roads in response to live traffic conditions. The introduction of a technology like this could substantively change a jurisdiction's traffic law by transforming a categorical rule to a more complex, technologically enabled, regulation system.

As another example, consider a hypothetical technology that allowed patent offices to precisely estimate the degree of innovation in a new invention claiming a patent. Doing so would allow for tailored patent terms in providing a longer duration of protection for more innovative inventions, and shorter duration for less innovative inventions. The introduction of this technology would enable a substantive change to the current binary that exists in patent law where—absent a few regulatory

44 See Insurance Institute for Highway Safety, 'Automated Enforcement Laws' (*IIHS-HLDI Crash Testing and Highway Safety*, May 2021) <<https://www.iihs.org/topics/red-light-running/automated-enforcement-laws>> accessed 3 May 2021.

exceptions—all patentable inventions are entitled to the same duration of protection,<sup>45</sup> and any inventions not meeting the patentability bar receive no patent protection at all.<sup>46</sup>

The sorts of legal technologies that enable the substantive alteration of legal rules are perhaps easiest to conceive in legal areas that do not raise contentious moral or ethical issues. In both of the examples provided above, technical designers could use relatively objective and clear utility functions to inform their design choices. In the case of traffic regulations—a largely amoral area of law—the function is to optimize both safety and efficiency, enabling those using the traffic system to safely reach their destinations in the most efficient manner. In the case of an innovation-measuring technology that optimizes patent terms, the utility function is a maximization of innovative output. This sort of technology would set out to tune the reward and incentive scheme provided by patent law to further this goal.

In areas of law where questions of morality are more salient, it is more difficult to imagine technologies that substantively alter the law in a manner that is not highly contentious. However, imagining dystopian technologies that substantively alter the law in contentious ways is not so difficult. Take for example a hypothetical invention that classifies speech as either constitutionally protected free expression, or regulatable unprotected speech. This would substantively alter free expression law by foregoing legislated rules or the use of judicial discretion, and instead create a technologically enforced rule wherein expressions deemed permissible are left alone, while those that are deemed impermissible are regulated accordingly—perhaps with a takedown notice or injunction requiring their correction. Even assuming the technology in question could accurately categorize speech into categories currently considered protected or unprotected—for instance by identifying fighting words<sup>47</sup>—automating the decision-making process and removing humans from the deliberation would be highly contentious. It would forego the possibility that new exceptions could be identified, or new interpretations made, while also precluding change in the meaning of words or the social context through which they are understood. Unlike the less controversial examples above, there is no objective utility function with which to design this technology. Not only do we not know how to accurately classify speech as protected or not protected—indeed it may be impossible to do this without a huge amount of contextual information—but perhaps more importantly, there is great disagreement about what should be in these categories. For instance, reasonable people can and do disagree about what it means to be threatening and the appropriate role of the fighting words doctrine in limiting (or not) free expression.<sup>48</sup>

45 See eg, 35 USC s 154; Patents Act 1977 (UK) s 25. Laura G Pedraza-Fariña and Ryan Whalen, 'A Network Theory of Patentability' (2020) 87 U Chi L Rev 63 (proposing a technologically enabled method of operationalizing innovation).

46 See eg, 35 USC s 101; Patents Act 1977 (UK) s 1.

47 See *Chaplinsky v State of New Hampshire* (1942) 315 US 568 (defining 'fighting words' as 'those which by their very utterance inflict injury or tend to incite an immediate breach of the peace').

48 See eg, Stephen W Gard, 'Fighting Words as Free Speech' (1980) 58 Wash U L Q 531; William C Nevin, 'Fighting Slurs: Contemporary Fighting Words and the Question of Criminally Punishable Racial Epithets' (2015–2016) 14 First Amendment L Rev 127.

The lesson here is that technologies which substantively alter the law merit different degrees of oversight depending on whether or not they are able to integrate objective criteria in the way in which they transform the rules they alter. Some areas of law are largely divorced from contentious moral considerations and are either implicitly or explicitly structured in such a way as to produce some agreed upon outcome. These areas of law are most amenable to legal tech developments as they set out clearer design standards and raise fewer sensitive questions. Other areas of law do not present operationalizable objective criteria that can be used to inform its design. As such, these areas of law are less likely to be able to uncontroversially adopt technologies that substantively alter the law. In these areas, it may be that the humanness of the legal endeavour is central to the legal system's legitimacy.<sup>49</sup>

### Functional implications

In addition to the way technology can substantively change the law, it can also give rise to functional implications that affect the way we interact with the law. These arise when the technology changes some facet of the way the law functions, or the way we practice, access or engage with the law—but do not necessarily alter the substance of a rule or make legal determinations. For instance, the adoption of a case management system that enables a court to hear more cases per day and thereby reduce the time required to render judgment has functional implications. Although they do not alter legal substance, these changes can be normatively important. Most consider the timely rendering of justice to be an important aspect in a well-functioning legal system,<sup>50</sup> as the saying goes 'justice delayed is justice denied', and thus the adoption of a technology that improves timeliness makes a normative improvement to the legal system without altering legal substance.

As another example, consider the implications that arise from a self-executing contract. These agreements—sometimes referred to as 'smart contracts'—do not alter the substance of contract law.<sup>51</sup> Indeed, like all contracts they assume that contract law is a largely settled matter and rely on it to inform agreement drafting. However, the self-executing nature of these contracts has functional implications for the way in which private factors establish and enforce legal obligations. Because a truly self-executing contract automates enforcement of the agreed upon terms, it obviates the need for third-party enforcement. When a traditional contract is allegedly breached, the parties must ultimately rely on the state to enforce compliance or provide a remedy. In contrast, a self-executing contract does not allow for breach and, in theory at least, makes dispute resolution by arbitration or the state unnecessary. This has functional implications for the legal system by essentially rendering its dispute resolution function obsolete in enforcing the agreements between contracting parties.

These functional implications can also extend to the way that the law is structured. For instance, consider the implications of the introduction of tax preparation software. These programmes make it easier to navigate complex tax laws and apply

49 See Michael A Livermore, 'Rule by Rules' in Ryan Whalen (ed), *Computational Legal Studies* (Edward Elgar Publishing 2020); Aziz Z Huq, 'A Right to a Human Decision' (2020) 106 Va L Rev 611.

50 See eg, Charter of Rights and Freedoms (stipulating a right 'to be tried within a reasonable time').

51 For an overview of smart contracts, see Raskin (n 6).



them to one's own—or one's client's—circumstances. As such, these sorts of software effectively make applying the law simpler, abstracting complexity away from the end user. But, these applications and other analogous legal technologies also have a more direct structural effect on the law that actually enables the complexity they seek to mitigate.<sup>52</sup> By making legal complexity easier to navigate, legal technologies can make it more practical for legislators and regulators to draft laws and regulations with a degree of complexity that would not be feasible absent the technological capacity to navigate them.

We have seen similar 'complexification' of the law enabled by the general use information retrieval technologies that are now common throughout legal study and practice. Berring argues that legal information retrieval systems, define the world of 'thinkable thoughts'<sup>53</sup> and that moving from published opinion reporters with clear categories and indices to full text search, atomizes the law creating a complex and evolving web of law and legal practice.<sup>54</sup>

While functional implications are diverse, they share the trait of enabling legal change by altering how we practice, access or engage with the law, rather than by acting on the law itself by changing rules or making legal determinations. As such, these implications are one step removed from the law. They do not alter or engage with it directly, but by changing practical aspects of how humans engage with the law, they can have great influence.

### General implications

In addition to the legal implications that technology can have by enabling changes to the law itself, and the functional implications it can have by altering methods of legal practice and the way legal systems function, legal technologies can also have more general social implications as they alter the communities governed by the legal systems that adopt them. These non-legal implications are like those that can arise from any technology, and I thus refer to them as 'general implications' here. This type of implication often arises as a consequence of the substantive and functional changes brought about by legal technology. Because the legal system is so thoroughly intertwined with society, changing the substance of the law, or altering its practice in functionally important ways, will almost certainly have follow-on effects that are non-legal in nature.

As an example, consider the general implications of writing down the law. Prior to the invention of writing, law—such as it was—would have been rooted in oral tradition and communal deliberation—perhaps interpreted or guided by some community elders or officials.<sup>55</sup> There are of course many differences between societies which use writing and those that do not, and the changes arising from writing down laws are only one of many. But that single act of transitioning from a system of laws that are not encoded to one where they are written down has substantial implications

52 Lawrence Zelenak, 'Complex Tax Legislation in the TurboTax Era' (2010) 1 Colum J Tax L 91.

53 Berring, *Legal Research and the World of Thinkable Thoughts* (n 13) 305.

54 Berring, *Legal Research and Legal Concepts* (n 8).

55 Andrew D Madden, Jared Bryson and Joe Palimi, 'Information Behavior in Pre-Literate Societies' in Amanda Spink and Charles Cole (eds), *New Directions in Human Information Behavior* (Springer Netherlands 2006) <[https://doi.org/10.1007/1-4020-3670-1\\_3](https://doi.org/10.1007/1-4020-3670-1_3)> accessed 10 September 2020.

for how society can be ordered. It, at least in theory, makes the law clearer. It gives it further geographic reach and more consistency as it spreads from its point of origin. The greater consistency and certainty allowed by writing down the rules that govern legal relationships encourages innovations in commerce and industry. Posner argues that the capacity to write down rules—and thus to subsequently update, remove or change them—enables the law to develop at a faster pace, and thus enables more dynamic social systems.<sup>56</sup> Similarly, Vismann argues that a society's legal framework is, at least in part, a function of its techniques and technologies for producing records.<sup>57</sup> The general implications that can arise when a legal system adopts the technology of writing are so fundamental and varied that they can be difficult to perceive from our current perspective within a highly technologically enabled legal system and society. That said, this example of a legal tech adoption—in this case the adoption of the generic technology of writing to legal practice—provides a clear demonstration of how legal technology can have wide ranging general implications beyond the law.

For a more future-oriented example of how adopting a legal technology could have implications beyond the legal system, consider the variety of ways that self-driving cars might alter the built environment. A true fully automated car, with the so-called Level 5 automation,<sup>58</sup> would be in the 'generic legal tech' category described above. Although not specifically designed for legal uses, these automobiles would 'know' all relevant traffic laws and constantly be making determinations based on them. While the introduction of Level 5 autonomous automobiles would almost certainly ultimately lead to substantive legal implications—after all many existing traffic laws are only required because humans are not very adept at coordinating high-speed transit—it would also have more general effects by altering transportation practices. This could influence where people choose to live and work, how public transit is funded, and much of urban planning.<sup>59</sup>

The set of general implications that have arisen, and may arise in the future, due to the adoption of legal technology are too varied to cover here exhaustively. The wide-ranging importance of the legal system to social, political and cultural ordering means that when technologies alter the law or legal practice, there are often follow-on implications beyond the law itself.

These three types of implications can be ordered hierarchically in terms of how directly they implicate the law or the legal system—substantive implications are the closest to the law altering its substance; functional implications are one step removed from the law itself, altering the law by changing legal practice; finally, general implications arise when legal technologies have effects beyond the law or legal practice.

Every legal technology has its own propensity for generating each of these distinct types of implications. Some will be of minor import, and have few meaningful implications at all, while others have the potential to greatly transform the law, legal

56 Posner (n 11).

57 Cornelia Vismann, *Files: Law and Media Technology* (Stanford University Press 2008).

58 'Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles' <<http://standards.sae.org/>> accessed 2 February 2022.

59 Eva Fraedrich and others, 'Autonomous Driving, the Built Environment and Policy Implications' (2019) 122 *Transp Res A Poly Pr* 162.

practice or society more generally. As a result, the development and adoption of legal technologies should be done with care and awareness of what may come.

### LEGAL TECH DESIGN AND ADOPTION CONSIDERATIONS

Mapping legal technologies in the way proposed above—according to how directly they engage with the law, and how specifically they afford legal uses—and understanding that the implications of legal technologies can fit within the above taxonomy as either legal, functional or general, provides a framework to more precisely discuss and understand both the varied types of legal technology and the concerns that arise from their design and adoption. Although in theory each type of implication could arise from technologies within any of the described legal tech quadrants, these tendencies are not evenly distributed across the space. Increasing directness increases the likelihood that a technology will have substantive legal implications, moving upwards in specificity makes functional implications more likely, while moving towards the generic end of the spectrum makes important general implications more probable. Understanding these tendencies can assist the work of those who study, design, regulate or adopt legal technologies.

Just as any technology can have general implications, any legal technology can as well. That said, the more generic a technology is the more likely it is to have wide-ranging and important general implications.<sup>60</sup> As we move upwards in the specificity dimension, we reduce the probability of encountering technologies that produce these diffuse effects on society. This is not to say they are not possible, but rather that the probability of general implications decreases as a legal technology becomes more specifically designed for legal uses.

General implications are characterized by their diffuse nature. They can thus be difficult to predict when a technology is in its infancy. Given this, when it comes to anticipating and addressing the potential general implications of their products, legal technologists face a similar set of considerations as technologists more generally: more generically useful technologies are more likely to have wide-ranging general implications and they thus require careful forethought about the effects they may have.<sup>61</sup>

As technology moves from the generic towards the specific end of the spectrum, it becomes more likely to have functional implications on the legal system. By definition, these specifically legal technologies influence how we engage in legally related activities. It is therefore in their nature to alter the way legal systems function and they thus raise issues that are important to the legal profession. For instance, specific legal technologies are more likely to raise issues related to access to justice.<sup>62</sup> These

60 Timothy F Bresnahan and Manuel Trajtenberg, 'General Purpose Technologies "Engines of Growth"?' (1995) 65 *J Econometrics* 83.

61 It seems likely that a similar dynamic exists within technologies that are used across varying levels of legal generality. Legal technologies will have use for a varied number of practice areas. For instance, one might only be useful for trademark practice, whereas another might be useful to all civil litigation. Those legal technologies that are more 'generically legal' by being useful to more practice areas, are more likely to have general implications across the law. Their developers therefore have a greater responsibility to carefully consider the way their technologies may affect the law and legal practice.

62 Deborah L Rhode, *Access to Justice* (Oxford University Press 2004); See also William Lucy, 'Access to Justice and the Rule of Law' (2020) 40 *Oxf J Leg Stud* 377 (arguing for a more nuanced appreciation of the relationship between access to justice and the rule of law.).

technologies have the capacity to reduce the cost of legal services, thereby improving access to justice,<sup>63</sup> or alternately provide tools only available to those who can afford them, thereby making access to justice less equal.<sup>64</sup> Because of the functional implications that are in their nature, specifically legal technologies are more likely to raise professional ethics-related design considerations. Designers of specifically legal technologies must, therefore, take into consideration the effects their technologies may have for consumers of legal services. Depending on their own interests, they may also wish to consider the effects on the legal profession more generally. After all, these functional implications are most likely to be relevant to those who make their living in a legal capacity.<sup>65</sup>

In the other dimension, technologies that are more directly legal in nature, that is to say those that incorporate the law as a component or make unmediated legal determinations, are more likely to have substantive legal implications. Their capacity to engage directly with the law, means that these directly legal technologies can facilitate different rules than those that exist absent the technological enablement in question. By enabling substantive changes to the law, these technologies are more likely to raise normative concerns such as fairness, equality, due process or transparency.

Because of the normative concerns that can arise when technologies have the capacity for substantive legal implications, they must be treated with great care. Some would argue that these technologies should be strictly limited to a few areas of law, so as not to detract from law's inherent humanity<sup>66</sup> At the least, these technologies are less likely to raise serious concerns when they engage with areas of law that do not raise serious moral questions.<sup>67</sup> When the law in question consists of 'coordinating rules'<sup>68</sup> with a clear utility function—such as the traffic law function of enabling safe and expedient movement of traffic—there is little concern about the substantive implications a technology might have. All that we care about is that the rule in question effectively achieves its purpose. On the other hand, when the laws in question raises important moral considerations—for instance criminal laws—we should be concerned about the substantive changes that legal technologies might enable. In these instances, technology must not be used to deprive individuals of their 'right to a human decision'<sup>69</sup> and if it is used at all, should be initially adopted in a hybrid form alongside human decision makers.<sup>70</sup>

63 McGinnis and Pearce (n 3).

64 Emily S Taylor Poppe, 'The Future Is Complicated: AI, Apps & Access to Justice Symposium: Lawyering in the Age of Artificial Intelligence' (2019–2020) 72 *Okla L Rev* 185.

65 For discussion on professional implications of legal tech, see Richard Susskind, *The End of Lawyers?: Rethinking the Nature of Legal Services* (Revised edition, Oxford University Press 2010); but see Markovic (n 39) (arguing that technology is unlikely to undermine the market for professional legal services).

66 Pasquale (n 4).

67 See Arti K Rai, 'Machine Learning at the Patent Office: Lessons for Patents and Administrative Law' (2018) 104 *Iowa L Rev* 2617 (arguing that patent offices offer an appropriate proving ground for machine learning in law).

68 Shapiro (n 20).

69 Huq (n 49).

70 Tim Wu, 'Will Artificial Intelligence Eat the Law? The Rise of Hybrid Social-Ordering Systems' (2019) 119 *Colum L Rev* 2001.

Legal technologists, regulators and practitioners should take these considerations into account. When developing, adopting or choosing whether to regulate legal technologies, one must understand what kind of technology it is and what type of implications it is most likely to give rise to. Mapping the technology in question according to how directly and specifically legal it is can help do so.

### CONCLUSION

Legal technologies are diverse. They have the potential to both improve access to justice and to exacerbate inequality. Without a sufficiently rich conceptualization and an accompanying vocabulary, we risk eliding this diversity and impeding our ability to both capitalize on legal technology's promises and face the challenges it raises. This article has offered a definition of legal technology as 'all devices, capable of being used as a means for interacting with the substance of law or assisting its user to interact with the law, and the skills and techniques by which we use them.' It then categorized these technologies according to how directly they engage with the law and how specifically legal or general their affordances are. This reveals four types of technologies: generic; generic legal tech; shallow legal tech and deep legal tech. These provide a framework to think about and discuss legal technologies that extends beyond the usual 'area of law' categorizations that accompany them.

In conjunction with the legal tech definition and categorization, the taxonomy of legal tech implications as either legal, functional or general helps add nuance to discussions about the importance of legal technologies, and how they may alter the law, legal practice or society more generally. Legal technologies that are more generic are less likely to give rise to regulatory concerns when they are adopted for legal purposes. On the other hand, the more directly a technology engages with legal rules, the more likely it is to raise normative legal issues, such as concerns about justice, equality and democracy.

Although there is much uncertainty about the future of legal systems, it is almost certain that technology will play an increasingly high-profile role in practicing, accessing, enforcing and making the law. It is essential that, as we consider the future, we do so in a sufficiently nuanced manner to ensure we both benefit from the efficiency gains that legal technologies can offer, while also avoiding their more pernicious possibilities.