

# LEXOPTIMA: THE PROMISE OF AI-ENABLED LEGAL SYSTEMS

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**Abstract.** *Emerging technological developments, such as advancements in machine learning, natural language processing, predictive analytics and new and emerging methods in artificial intelligence, are poised to significantly transform legal systems. These technologies are already enhancing the predictability of litigation outcomes and beginning to automate aspects of legal research and adjudication processes. Current legal systems, however, are not ready to leverage these developments optimally and to distribute their benefits equitably. This article critically examines the potential for a new AI-enabled legal model we call LexOptima. LexOptima is characterized by its use of decentralized, community-driven data and algorithms to generate—in real-time—context-aware law and personalized legal services. LexOptima has the potential to radically improve access to justice, reduce bias in legal processes, empower communities to play a greater role in the creation and development of law and policy, and increase efficiency in legal institutions. However, the transition to such a model also faces significant challenges, including issues of data privacy, resistance by incumbent interests, algorithmic transparency, and the need for robust human oversight. Drawing upon an interdisciplinary analysis of relevant literature and technological trends, we provide a conceptual framework for LexOptima and explore its potential benefits and limitations. We conclude by proposing key considerations and next steps for a dynamic, human-centered approach to legal system transformation that optimally and inclusively leverages the strengths of humans and AI-enabled technologies.*

**Keywords.** Access to justice, Artificial Intelligence (AI), community-driven law, data-driven law, decentralization, legal singularity, legal transformation, LexOptima.

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## I. Introduction

“We can only see a short distance ahead, but we can see plenty there that needs to be done.”<sup>1</sup>

— Alan Turing, 1950

Current legal systems are ill-equipped to optimally leverage the benefits of artificial intelligence (AI). Our legal systems and institutions often struggle to provide affordable access to justice. Worldwide, estimates suggest that over a billion people have unmet civil or administrative justice needs, and countless others are excluded from opportunities that the law provides.<sup>2</sup> A significant number of people do not seek legal advice to understand or resolve their problems, with a large proportion reporting severe difficulties investing the necessary funds to address their legal issues.<sup>3</sup>

The complexity of the law, coupled with the high costs and time-consuming nature of legal processes, can create significant barriers for individuals seeking justice.<sup>4</sup> The inability of many to navigate the legal system effectively leads to a sense of frustration and disillusionment and can result in severe delays and tragic outcomes.<sup>5</sup> More generally, as society becomes increasingly digitized and globalized, traditional legal frameworks and institutions are wrestling with novel challenges, such as regulating emerging technologies, protecting digital rights, and resolving cross-border disputes. Overall, our systems wrestle to keep pace with society’s rapidly evolving needs and account for the increasing complexity of legal issues in

<sup>1</sup> A.M. Turing, “Computing Machinery and Intelligence” (1950) 59:236 *Mind* 433 at 460 <<http://phil415.pbworks.com/f/TuringComputing.pdf>>.

<sup>2</sup> Sarah Chamness Long & Alejandro Ponce, *Measuring the Justice Gap: A People-Centered Assessment of Unmet Justice Needs Around the World* (Online: World Justice Project, 2019).

<sup>3</sup> Camilo Gutiérrez Patiño, et al, *Global Insights On Access To Justice: Findings From The World Justice Project General Population Poll In 101 Countries* (Online: World Justice Project, 2019).

<sup>4</sup> See generally George R Wright, ‘The Illusion of Simplicity: An Explanation of Why the Law Can’t Just Be Less Complex’ (2000) 27:3 *Florida State U LR* 715; Rabeea Assy, ‘Can the Law Speak Directly to its Subjects? The Limitation of Plain Language’ (2011) 38:3 *J L & Society* 376; Daniel Martin Katz and Michael James Bommarito, ‘Measuring the Complexity of the Law: The United States Code’ (2014) 22:4 *Artificial Intelligence & L* 337. See also the seminal works by William L.F. Felstiner, Richard L. Abel & Austin Sarat, “The Emergence and Transformation of Disputes: Naming, Blaming, Claiming . . .,” (1980–1981) 15 *Law & Society Review* 631; Marc Galanter, *Why the “Haves” Come Out Ahead: Speculations on the Limits of Legal Change*, (1974) 9 *Law & Society Review* 95.

<sup>5</sup> See, e.g., *R v Capay*, 2019 CanLII 535 at para 414 (ONSC); Martin Patriquin, ‘Why Adam Capay spent 1560 days in solitary’ *Maclean’s* (2 November 2016), online: <<https://macleans.ca/news/canada/why-adam-capay-has-spent-1560-days-in-solitary/>>.

the modern world.<sup>6</sup>

In this article, we reimagine our legal systems and institutions and explore how we can better position them to fully harness the potential of new technologies and address these challenges. To that end, we envisage a new, AI-enabled model of law—we dub it ‘LexOptima’<sup>7</sup>—capable of leveraging the power of technology to foster greater citizen participation, inclusivity, efficiency, and trust. In doing so, we aim to ride, not resist, the technological wave already challenging our legal systems and offer a fresh perspective on the promise and perils of what we see as an inevitable transformation.<sup>8</sup>

Recently, new AI tools such as multimodal large language models (LLMs) have taken the world by storm, making ChatGPT the fastest-growing consumer application in history.<sup>9</sup> Sophisticated AI applications, capable of generating human-like text and images, composing music, and allowing users to effortlessly process the entire internet, have surprised a world underprepared for their appearance. The innovation and capabilities such tools bring have sparked a newfound fascination around technology and its potential impact in various fields. In the legal domain, the widespread advancements in artificial intelligence are rapidly beginning to affect legal systems, practices, and institutions.

However intriguing, current AI tools are just the thin edge of the wedge. Tech companies like OpenAI strive to develop powerful and safe artificial general intelligence (AGI) to realize unprecedented scientific and technological breakthroughs.<sup>10</sup> By 2030, technologies like GPT-4 will probably be regarded as ancient history and seem quaintly obsolete. Given the speed at which technology advances, we will likely witness in the foreseeable future new AI systems that combine diverse capabilities far beyond our current understanding. Current AI systems will develop into technologies that interoperate with and govern virtually everything in our lives, and humans will frequently and seamlessly interact with numerous AI agents and applications.

As these technologies evolve, the availability of adequate computation to support the work of these AI agents will initially be an obstacle to widespread access to the best-performing systems. However, even the systems that are not on the cutting edge will exhibit performance that, from today’s perspective, will be otherworldly. AI systems will eventually get to know humans far better and deeper than we know ourselves. AI will effectively draw upon a multi-

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<sup>6</sup> On the inadequacies of our current legal institutions and the need for a system revamp see Gillian K. Hadfield, *Rules for A Flat World: Why Humans Invented Law and How to Reinvent It for a Complex Global Economy* (Oxford University Press, 2017).

<sup>7</sup> This term combines ‘Lex’ (the Latin word for law) with ‘Optima’ (meaning best or optimal). Thus, LexOptima alludes to an optimized, efficient, and advanced legal system that leverages AI technologies to improve legal processes, institutions, and outcomes.

<sup>8</sup> We are far from alone in recognizing the importance of this incoming technological wave for law. See Deborah W. Denno and Erica Valencia-Graham, “The New AI: The Legal and Ethical Implications of ChatGPT and Other Emerging Technologies” (Symposium Foreword) (April 2, 2024). Fordham Law Legal Studies Research Paper No. 4781724, (2024) 92 Fordham Law Review, Available at SSRN: <https://ssrn.com/abstract=4781724>.

<sup>9</sup> Cindy Gordon, “ChatGPT is the Fastest Growing App in the History of Web Applications”, *Forbes* (2 February 2023) online: Forbes <<http://www.forbes.com>>; Viraj Mahajan, “100+ Incredible ChatGPT Statistics & Facts in 2023”, *Reuters* (13 October 2023).

<sup>10</sup> See for example, Lance Eliot, “About That Mysterious AI Breakthrough Known as Q\* by OpenAI That Allegedly Attains True AI or is on the Path Toward Artificial General Intelligence (AGI)”, *Forbes* (26 November 2023) online: Forbes <<http://www.forbes.com>>; Jonathan O’Callaghan, “How OpenAI’s Text-to-Video Tool Sora Could Change Science – and Society” (12 March 2024), online: Nature <<http://www.nature.com>>; Ben Wodecki & Deborah Yao, “Google DeepMind Breakthrough is ‘Milestone’ Toward AGI” (18 January 2024), online: AI Business <<http://aibusiness.com>>.

layered technology stack, including elements such as data mining, AGI, predictive AI, heuristic AI, AI for Natural Language Processing (NLP), decisive AI, speech recognition, and numerous new applications we currently do not foresee.<sup>11</sup> Machines have already surpassed human performance in specific domains such as chess, Go, Jeopardy!, data analysis, video games, image labelling, language understanding, and speech recognition. As AI continues to excel in many other tasks, insistence on deep and direct human micromanagement and intervention could in fact become a hindrance to efficiency and further progress.

This new reality will result in profound potential transformations and opportunities for our legal systems. Contemporary legal systems worldwide rely heavily on humans for their development, enforcement, and implementation. These systems have evolved in various legacy environments, where human labour and wisdom—rather than data and processing power—have operationalized and sustained legal processes and institutions. Thus, we must radically reform and adapt our legal systems to the newly emerging technological reality, ideally allowing for ongoing accommodation of indefinitely many future technologies we have yet to clearly anticipate.

LexOptima, as we envisage it, is a decentralized, AI-optimized and future-ready legal model that responds to this need. It is characterized by its community-driven and individualized nature, where the law is not dictated top-down. We imagine a system in which legal norms, practices and principles emerge from enormous datasets of publicly available information, and the collective actions and preferences of individuals and community members. In its ideal form, LexOptima aims to leverage technology to make legal systems more accessible, equitable, and efficient, thus fostering implicit trust and participation.<sup>12</sup>

The transition to an AI-dominated landscape not only offers immense benefits but also carries unprecedented risks.<sup>13</sup> While society has made some progress in supporting and recognizing the agency of individuals and diversifying the voices we hear in the legal sphere (and elsewhere), new technologies will continue to provide increasingly more voice, power, and prominence to machines. This shift from humans to machines raises natural concerns and portends a future imbued with uncertainty.

As we progress further into the 21st century, the interaction of technology with law will

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<sup>11</sup> The following simplified definitions may assist readers who are less familiar with these technologies. Data mining is the process of using large data sets to identify patterns and relationships that may enable predictions of future trends. AGI refers to highly autonomous systems that are capable to outperform humans in a wide range of cognitive tasks. Predictive AI reflects a computer program's ability to use statistical analysis to identify patterns, anticipate behaviors, and forecast future events. Heuristic AI is an approach in artificial intelligence that involves using rules or guidelines to solve problems or make decisions, often in situations where there is no clear-cut solution. AI for NLP involves the use of AI techniques to process and understand human language, enabling machines to interact with and interpret text or speech data. Decisive AI are systems or algorithms designed to make decisions or take actions based on the analysis of data and predefined rules or criteria. Finally, speech recognition is a technology that enables devices to convert spoken language into written text or commands, allowing users to interact with technology through voice input.

<sup>12</sup> In this respect, our work considers and responds to the concern that algorithmic decision-making processes will constrain and limit opportunities for human participation and pose challenges to the moral or political legitimacy of public decision-making processes. For discussing these concerns, see, e.g., John Danaher "The Threat of Algocracy: Reality, Resistance and Accommodation" (2016) 29 *Philosophy & Technology* 245.

<sup>13</sup> See generally Joshua Rothman, "Why the Godfather of AI Fears What He's built", *The New Yorker* (13 November 2023) online: The New Yorker <<http://www.newyorker.com>>; Sir Peter Gluckman, "Science for Society: Now and in the Future" (Keynote address at the Institute for Advanced Study, University of Amsterdam, 7 November 2023), online: Koi Tū: The Centre for Informed Futures <<http://informedfutures.org>>.

become increasingly significant.<sup>14</sup> With AI fueling what some have dubbed ‘legal singularity,’ we are on the brink of a tectonic change in how laws are made, accessed, interpreted, applied and enforced.<sup>15</sup> In essence, legal singularity refers to a reality where AI can replicate most, if not all, tasks currently undertaken by human legal professionals. This capability could facilitate ‘algorithmic regulation,’ where legal decisions are recommended (and eventually reached) using algorithms that implicitly and explicitly consider a plethora of variables, scenarios, and previous experience. This move towards ‘computability,’ where the law is dynamic and legal outcomes can be machine-generated with a previously unattainably high degree of confidence, will profoundly shape the trajectory of our legal systems and societies.

Legal singularity, however, does not contemplate a monolithic legal regime that imposes one dominant approach, school of thought, or tradition. It is perfectly compatible with legal flexibility and adaptability, including with the ideas associated with personalized law. Personalized law, for its part, proposes that law can be tailored to individual circumstances and personal traits. The personalized law path is a radical departure from the ‘one-size-fits-all’ approach of traditional law, potentially leading to more equitable and efficient outcomes. As we explain below, our proposed AI-enabled model embraces the path of personalized law and takes it a step further, attempting to ensure that our legal systems better facilitate inclusion, diversity, and transparency.

The increased adoption of digitized forms and procedures notwithstanding, legal systems and the legal profession are notoriously resistant to change.<sup>16</sup> Despite the judiciary’s significant capacity for exercising thorough oversight of other social actors, (centralized) courts are often rigid in their operation and slow to respond to new realities.<sup>17</sup> They are too often ill-equipped to address the wide collection of issues brought before them, and are perceived by some as lacking the legitimacy to intervene and exercise their power. Moreover, by design, centralized courts are difficult to hold to account.<sup>18</sup>

Many of the thorniest challenges humanity faces and the law seeks to tackle stem from systemic imbalances of wealth, access, and power.<sup>19</sup> With proper planning and insight, the power of technology can be used to optimally decentralize and democratize legal systems. Thus far, the law has mostly lagged social and technological developments: law and regulation advance slowly and incrementally, whereas technology evolves rapidly. An AI-enabled legal system, as we envisage it, would harness powerful technological developments to help law to bridge this gap.<sup>20</sup> Law will no longer be destined to fall perpetually behind; instead, it will use

<sup>14</sup> Daniel J Gervais & John J Nay, “Artificial Intelligence and Interspecific Law” (2023) 382:6669 *Science* 376.

<sup>15</sup> For a book-length discussion see Abdi Aidid & Benjamin Alarie, *The Legal Singularity: How Artificial Intelligence Can Make Law Radically Better* (Toronto: University of Toronto Press, 2023).

<sup>16</sup> See for example, Deborah L Rhode, “Reforming American Legal Education and Legal Practice: Rethinking Licensing Structures and the Role of Nonlawyers in Delivering and Financing Legal Services” (2013) 16:2 *Leg Ethics* 243, Simon Lewsen, “Give Me Paper or Give Me Death: Why Law Firms Need to Embrace Innovation”, *The Globe and Mail* (15 November 2023) online: *The Globe and Mail* <<http://www.theglobeandmail.com>>.

<sup>17</sup> Guido Calabresi, *A Common Law for the Age of Statutes* (Harvard University Press, 1982); Deborah L Rhode & Alice Woolley, “Comparative Perspectives on Lawyer Regulation: An Agenda for Reform in the United States and Canada” (2012) 80:6 *Fordham L Rev* 2761.

<sup>18</sup> For influential scholarship see Alexander M. Bickel, *The Least Dangerous Branch* (Yale University Press, 1986); Jeremy Waldron, “The Core of the Case Against Judicial Review” (2016) 115:6 *Yale LJ* 1346.

<sup>19</sup> For a macro perspective on the challenge of access to justice see Abi Adams-Prassl & Jeremias Adams-Prassl, “Systemic Unfairness, Access to Justice and Futility: A Framework” (2020) 40:3 *Oxford J Leg Stud* 561.

<sup>20</sup> To be sure, there is a growing literature discussing the deployment of AI tools in Law and developing human value centered AI. See for example, Katie Atkinson, Trevor Bench-Capon & Danushka Bollegala, “Explanation in AI and Law: Past, Present and Future” (2020) 289 *Artificial Intelligence* 103387; Bart Verheij, “Artificial Intelligence as Law” (2020) 28:2 *AI & L* 181.

and integrate state-of-the-art technologies to radically evolve towards practical and functional completeness (i.e., toward legal singularity).

While predicting the future is a complex undertaking and an inherently uncertain endeavour, the optimistic vision of AI-enabled legal systems presented in this article is not mere speculation. Rather, it is rooted in the current trajectory and evolving landscape of AI technologies, a rational extrapolation of their capabilities to the legal domain, recent multi-disciplinary developments, and a pragmatic, albeit hopeful, assessment of future possibilities. Of course, technology and decentralization in the law cannot be guaranteed to be salutary; there could be various downsides, including bias, potential misuse, political resistance, privacy concerns and challenges to current frameworks surrounding intellectual property.<sup>21</sup> The journey towards AI-optimization will be one of testing and exploring. However, if properly conceptualized and implemented, the envisaged model promises to be more inclusive, just, efficient, and democratic.<sup>22</sup>

The remainder of this article is structured as follows: In Part II, we explain the foundational aspects of an AI-enabled legal system. The discussion in this part focuses on the interconnectedness of data, technology, and decentralization and proposes core values that should guide its operation. Since “the devil is in the details,” we move to a more nuanced discussion of the role of data and technology in Part III. Here, we describe the four types of data that the envisaged system will incorporate and their value and importance. We expand this conceptualization in Part IV, offering a spectrum of operations for LexOptima. In doing so, we distinguish between a modest ‘facilitating’ mode and a more ambitious ‘transformative’ role. In Part V, we discuss the potential limitations and weaknesses of this new model, drawing on relevant literature and technological developments. We conclude by emphasizing the need for a robust discussion about the future of law and technology.

## II. *AI-Enabled Legal Systems*

“Prediction is very difficult,  
especially about the future.”<sup>23</sup>

– Niels Bohr

Before moving to address the operational details, let us first define what we mean by an “AI-enabled legal system.” The discussion below aims to succinctly explain the core idea of LexOptima and its key components, providing a high-level overview. In essence, we argue that data, technology, and decentralization form the tripartite foundation of the envisioned system. Section A explains that by capitalizing on the power of data and technology, LexOptima would aim to foster a legal regime that is more (1) dynamic and efficient, (2) inclusive, democratic, and diversified, and (3) equitable. Section B further discusses the ways that data and technology will decentralize the legal system.

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<sup>21</sup> See *infra* Part V.

<sup>22</sup> As this article focuses on the potential (and risks) associated with LexOptima, it does not delve into the ailments of our current legal systems but merely occasionally alludes to them. We offer a more systematic review of the determinants of centralized legal systems and how AI-enabled systems can address them elsewhere; see Benjamin Alarie & Shmuel I Becher, *Superjustice: Transforming Law in the Age of AI* (work in progress).

<sup>23</sup> Attributing this quote to Niels Bohr is not without controversy. See for example, “The Perils of Prediction, June 2nd”, *The Economist* (15 July 2007) online: The Economist <<http://www.economist.com>>.

## A. Key Characteristics

We posit that as an “AI-enabled legal system,” LexOptima can be characterized as follows.

### 1. Dynamic and efficient.

Powered by algorithms, an AI-enabled system has the potential to dramatically increase efficiency in the creation and application of law. Equipped with these specialized yet generally highly capable algorithms, the speed of law creation and subsequent revisions and enforcement could accelerate significantly. This rapid pace of change, while promoting dynamism, could also present challenges to maintaining predictability and traditional forms of coherence within the legal system.<sup>24</sup>

In the early stages of the rollout of the new system, there may be initial hurdles and a slower pace of adoption. Some degree of transparency and explainability would play a critical role in these phases.<sup>25</sup> Transparency could prove beneficial not only to account for and explain the functioning of the system to its users, but also to elicit constructive feedback and contribute to iterative improvement. Such a cooperative approach could help to improve the system, making it more forceful and effective. Furthermore, transparency is a cornerstone in facilitating public trust, a fundamental aspect in successfully implementing reforms to facilitate the emergence of an AI-enabled system.<sup>26</sup> Once operational, the system will fundamentally alter how we perceive, interpret, enforce, and experience the law, leading to personalized law and the decoding of legal norm, reshaping legal processes and institutions.

### 2. Inclusive, democratic, and diversified.

As we explain in Part III, an AI-enabled system will incorporate multiple data types and break language barriers, making the law more responsive and sensitive to diverse legal systems and traditions. Moreover, this system will decentralize the law by employing technology to access, accommodate and incorporate sources of law outside the state and effectively put an array of legal orders in conversation with each other. Thus, an AI-enabled system will seek to actively engage individuals and communities in a way that promotes legal development akin to open-source platforms, taking participation and inclusivity seriously. As we see it, an AI-enabled legal system would be a non-hierarchical, community-driven system.<sup>27</sup> It would aim to strengthen access to justice and be more democratic than the status quo ante, facilitating and inviting more voices to collaborate and form the law than ever before. Such a formation of the law will better reflect the community it serves, increasing participation, buy-in and trust. In essence, an AI-enabled legal system would be a collective project, not the responsibility of distant legal actors. Invariably, it could reduce reliance on central institutions and bodies of law to bridge the gap between citizens and justice.

An AI-enabled legal system aspires to avoid the bottlenecks associated with central institutions and legal actors for ease of access to today’s law and to imagine decentralized ways of creating tomorrow’s law. But while such a system is defined in reference to this idealized

<sup>24</sup> For illuminating discussions relating predictability and stability to fairness, dignity, and the rule of law, see Jeremy Waldron, “The Rule of Law and the Importance of Procedure” (2011) *Getting to the Rule of Law* 3; Joseph Raz, “The Rule of Law and its Virtue” in *The Authority of Law: Essays on Law and Morality*, pp. 210-229 (Oxford: Oxford University Press, 2017)). In the context of LexOptima, one must consider the concern around black box algorithms; see *infra* Parts IV.B and V.A.

<sup>25</sup> Donghee Shin, “The Effects of Explainability and Causability on Perception, Trust, and Acceptance: Implications for Explainable AI” (2021) 146 *Intl J Human-Computer Studies* 102551.

<sup>26</sup> For a detailed discussion of the potential and limits of transparency see Archon Fung, Mary Graham & David Weil, *Full Disclosure: The Perils and Promise of Transparency* (Cambridge: Cambridge University Press, 2007).

<sup>27</sup> We return to this principle and explain it in more detail *infra* Part III.D.

form of decentralization, this form does not demand complete freedom from centralized institutions. As Section B clarifies, it is both undesirable and infeasible to demand complete legal diffusion or structurelessness. Fundamentally open to change, an AI-enabled legal system would be versatile and robust, optimally blending aspects of centralization and decentralization as technology advances.

### 3. Equitable.

The AI-enabled system we propose will promote fairness and justice, seeking to confront existing inequalities and biases by leveraging data and technology. Analyzing vast amounts of data, the system would identify and address disparities in the creation and application of the law. At the same time, ensuring equitable algorithms will require massive amounts of data and careful human oversight.

More generally, an AI-enabled system would regard access to justice as a core value. Here, it should endeavour to mitigate the systemic barriers that often prevent the vulnerable from seeking justice.<sup>28</sup> As discussed in more thoroughly in Part IV below, LexOptima would strive to harness the power of data and technology to democratize access to legal information, making it easier for individuals to understand their rights, obligations, and responsibilities. Overall, the goal is to create a landscape where justice is not only accessible to all but is also shaped by the collective input of diverse voices.

#### B. Decentralization

Readers may question our advocacy for a decentralized legal framework.<sup>29</sup> Conventional legal systems have traditionally valued structure, which fosters uniformity and predictability and aims to promote unity and uphold trust through centralized validation. This structure is evident in the judicial hierarchy, where lower courts focus on resolving disputes and higher courts contribute to developing substantive law.<sup>30</sup> Such systems clearly define roles and responsibilities, promoting accountability, division of labour, and efficiency.

However, the dynamic between structured and unstructured systems remains inherently complex, as the latter also holds its own allure. A more open system, with increased accessibility to citizens and lowered knowledge and resource barriers to pursuing and achieving justice, invites broader participation in legal processes.<sup>31</sup> As barriers are reduced, navigation through legal channels can become more fluid, enhancing individual empowerment.<sup>32</sup>

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<sup>28</sup> Martín Abregú, “The Challenges of Access to Justice” in Rudolf V Van Puymbroeck, ed, *Comprehensive Legal and Judicial Development: Toward an Agenda for a Just and Equitable Society in the 21st Century* (Washington, DC: World Bank, 2001) 53 at 60; William LF Felstiner, Richard L Abel & Austin Sarat, “The Emergence and Transformation of Disputes: Naming, Blaming, Claiming...” (1980) 15:3 Law & Soc’y Rev 631; Yotam Kaplan & Ittai Paldor, “The Other Side of the V: Addressing Injustice in Civil Litigation” (2023) Vand L Rev (forthcoming). See also Sarah Chamness Long & Alejandro Ponce, *Measuring the Justice Gap: A People-Centered Assessment of Unmet Justice Needs Around the World* (Washington, DC: World Justice Project, 2019); Camilo Gutiérrez Patiño et al, *Global Insights on Access to Justice: Findings from the World Justice Project General Population Poll in 101 Countries* (Washington, DC: World Justice Project, 2019).

<sup>29</sup> Some may also justifiably point to decentralized aspects of common law systems, noting the common law’s association with limited government. See, e.g., Paul Mahoney, “The Common Law and Economic Growth” (2001) 30 J. Legal Studies 503.

<sup>30</sup> Jonathan P Kastellac, “The Judicial Hierarchy: A Review Essay” (2016) Oxford Research Encyclopedia of Politics <<http://papers.ssrn.com>>; see also Louis Kaplow, “Multistage Adjudication” (2012) 126:5 Harv L Rev 1179.

<sup>31</sup> See Katherine LW Norton, “The Middle Ground: A Meaningful Balance Between the Benefits and Limitations of Artificial Intelligence to Assist with the Justice Gap” (2020) 75 U Miami L Rev 190.

<sup>32</sup> Laura Goodwin & Vivek Maru, “What Do We Know About Legal Empowerment? Mapping the Evidence”

Reducing complex obstacles can lead to a clearer understanding of legal operations, potentially fostering greater trust and engagement. Thus, incorporating elements of unstructured systems can render legal frameworks more adaptable and accessible, thereby enhancing access to justice.

In this context, Decentralized Finance (DeFi) is a compelling example. DeFi is a collective term for various bold projects aimed at creating open, permissionless, and trustless financial platforms through blockchain technology.<sup>33</sup> Interestingly, DeFi aims to consistently strike a delicate balance between the allure of a structureless approach and the practical need for structure. For example, Vitalik Buterin, the creator of Ethereum, outlines three criteria to assess the level of decentralization in a seemingly structureless community: (1) political decentralization, where the control of information dissemination is distributed across multiple centres; (2) architectural decentralization, referring to systems with multiple independent points for information entry; and (3) logical decentralization, in which systems are segmented into various independently functioning parts.<sup>34</sup> These three aspects are also crucial in determining decentralization within the realm of an AI-enabled legal system.

Just as the envisioned LexOptima model would aspire to enhance ‘access to justice,’ DeFi offers the prospect of ‘access to finance.’ Much like the aim to reduce barriers and intermediaries in legal access, DeFi allows people to engage in borrowing, lending, trading, and investing directly, bypassing intermediaries and structural limitations. However, in instances of illegal activities, violations, or system failures, DeFi initiatives experience considerable instability and may resort to centralized legal or technological oversight or regulation, which can (somewhat paradoxically) undermine user trust.<sup>35</sup>

Consider some of the early issues faced by Ethereum, a well-known platform for smart contracts and decentralized apps (dApps). In 2016, bugs in Ethereum’s code caused the Decentralized Anonymous Organization (DAO), an investor-led venture fund without formal management, to lose one-third of its funds. In response, the Ethereum community decided to split the blockchain into two branches, restoring the lost funds to their original owners. This “hard fork” allowed most stakeholders to recover their stakes in Ethereum, but it also revealed an implicit governance structure. In other circumstances, abuses of DeFi smart contracts have led parties to litigate disputes in traditional legal systems, highlighting the importance of what technology’s boosters have frequently derided as legacy technologies.<sup>36</sup> Indeed, purely structureless systems do not really exist; rather, it is more a question of the degree and salience of decentralized versus centralized governance structures.<sup>37</sup>

Decentralized systems like DeFi can empower users, broaden credit access, increase efficiency and speed, improve transparency, decrease friction, and streamline transactions. However, such systems can also be more vulnerable to various security risks, implying the need for pragmatic (exceptional) use of centralized tools and mechanisms of governance. The problem, however, is that in ostensibly structureless communities or operations such as DeFi,

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(2017) 9 Hague J Rule L 157; Marsha M Mansfield & Louise G Trubek, “New Roles to Solve Old Problems: Lawyering for Ordinary People in Today’s Context” (2012) 56:2 NYL Sch L Rev 367.

<sup>33</sup> See for example, Campbell R Harvey, Ashwin Ramachandran & Joey Santoro, *DeFi and the Future of Finance* (Hoboken: John Wiley & Sons, 2021); Saifedean Ammous, *The Bitcoin Standard: The Decentralized Alternative to Central Banking* (Hoboken: John Wiley & Sons, 2018).

<sup>34</sup> Vitalik Buterin, “The Meaning of Decentralization” (6 February 2017), online: Medium <<http://medium.com>>.

<sup>35</sup> Sirio Aramonte, Wenqian Huang & Andreas Schrimpf, “DeFi Risks and the Decentralization Illusion”, online: (December 2021) BIS Q Rev 21 <<http://www.bis.org>>.

<sup>36</sup> *Ibid.*

<sup>37</sup> “The Tyranny of Structurelessness”, online: Jo Freeman <<http://jofreeman.com>>.

no official body or individual guides these choices (or at least, this is the promise and commitment of these systems).

The lesson for LexOptima is quite straightforward: it must acknowledge and dynamically balance structure and structurelessness.

### III. *The Role of Data and Technology*

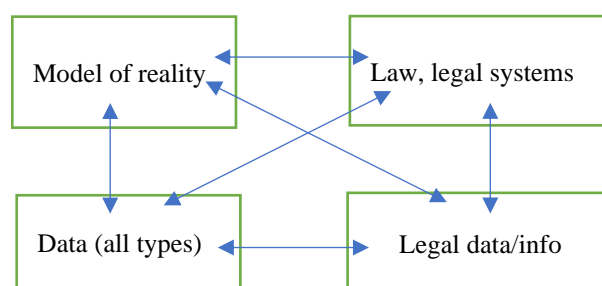
“Computers are useless. They can only give you answers.”<sup>38</sup>

– Pablo Picasso

A complex web of interdependence intricately connects reality, data, and legal systems. Data collection capabilities and practices, ever-evolving through scientific and technological progress, not only refine our perception of reality but also influence the evolution of societal values. This interplay between real-world events and data collection creates a dynamic cycle that continuously informs and redefines our worldview. It is imperative, therefore, to critically examine how and which data guide our evolving understanding of reality.

This interplay between reality and data collection capabilities and practices also shapes our laws and legal frameworks. Data can illuminate policy issues that existing legislation may need to address, while the operation of the legal system itself produces substantial amounts of legal data in the form of statutes, case law, regulations, contracts, patents, and other legal documents. Novel legal and extralegal insights from diverse data analyses can reveal shortcomings of current laws and motivate reforms. Similarly, decision-making within the legal sphere contributes to databases of legal information that data crunchers may leverage for new interpretations and insights. Through these cascading interactions across prevailing models of reality, information systems and governance, societies develop increasingly sophisticated approaches to thorny issues.<sup>39</sup> Figure 1 depicts these relationships.

**Figure 1. Reality, Data and Legal Systems**



The crux of the argument of this part—and to a large extent, this entire article—is that the proliferation of data and technological advancements will revolutionize the legal landscape. True, data are not the only factor influencing our perception of reality or designing and reforming our legal systems. A nuanced view incorporating critical social analysis around power, ethics, and policy offers a more complete picture of the dynamic interplay between

<sup>38</sup> Fred R Shapiro, *The Yale Book of Quotations* (New Haven: Yale University Press, 2006) at 591.

<sup>39</sup> Danah Boyd & Kate Crawford, “Critical Questions for Big Data: Provocations for a Cultural, Technological, and Scholarly Phenomenon” (2012) 15:5 *Information, Communication & Soc’y* 662.

reality, data, and legal governance. This intricacy notwithstanding, data—due to its prominence and potential—are a cornerstone of an AI-enabled legal system.

Just as oil fueled the global economic expansion of the 20th century, data have emerged as a crucial resource powering enterprises and driving growth in the 21st century digital age.<sup>40</sup> Vast troves of customer, user and sensor data collected across numerous systems have become the raw material for advanced research, training machine learning algorithms, targeted advertising, customized product development, creating large language models, predictive analytics, and more. Data are transforming how governments, agencies, and companies operate. Combined with AI capabilities, the new opportunities and risks for society are hard to grasp fully.<sup>41</sup>

The remainder of this Part focuses on data and technology, illustrating how technologies can scale the use of data and information flows in law. We portray a complex and elegant technological infrastructure that facilitates an amorphous, unbounded, and potentially nearly infinite legal and extralegal dataset, allowing for smart interaction and synthesis of an enormous amount of data and its transformation into legal information. Simply put, in its ideal form, we imagine a sophisticated legal system that can respond immediately, coherently, thoroughly, and accurately—though not necessarily conclusively—any possible legal question, situation, query, or dispute. We next delineate the types of data that can feed the proposed legal system, distinguishing four types of data. We highlight how each of these types of data brings something novel and significant to LexOptima.

#### A. Traditional Legal Data

The backbone of any legal system lies within its corpus of established legal materials. This includes laws and regulations, treaties, case law, court filings, litigation documents, contracts, IP registries, scholarly commentary, legal news, dictionaries, encyclopedias, blogs, public records, parliamentary transcripts, policy documents, administrative guidance, *etc.* To begin with, we envisage the digitization of this vast array of traditional legal data. These digitized data, in turn, provide the most elementary layer of raw material necessary for AI systems to analyze, understand and predict legal outcomes, and assist in policy evaluation and evolution.

The key feature in this context is the sheer volume and diversity of the legal data, which enables a nuanced understanding of legal principles and their application. Consider, for instance, language barriers. Often overlooked due to its ubiquity, language is arguably among humanity's most important inventions. Language not only facilitates nuanced interaction and complex social structures, but also enables the transmission of knowledge, cultural and otherwise, across generations, serving as the groundwork for scientific, philosophical, and cultural progress. Offering a system of symbols and rules, language allows for seemingly limitless combinatorial creativity, shaping thought, fostering community, and navigating social dynamics. In short, language is a cornerstone of our collective intelligence and societal

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<sup>40</sup> See generally, Thomas H Davenport & DJ Patil, "Data Scientist: The Sexiest Job of the 21st Century", *Harvard Business Review* (October 2012) online: Harvard Business Review <<http://hbr.org>>; "The World's Most Valuable Resource is No Longer Oil, But Data", *The Economist* (6 May 2017) online: The Economist <<http://economist.com>>. To be sure, the oil analogy is merely a metaphor, not a scientific comparison. See generally, Sy Taffel, "Data and Oil: Metaphor, Materiality and Metabolic Rifts" (2021) 25:5 *New Media & Soc'y* 980.

<sup>41</sup> For one example discussing some of the implications of using AI-powered systems that link together security cameras into a central hub see Joseph Cox, "AI Cameras Took Over One Small American Town. Now They're Everywhere" (2 November 2023), online: 404Media <<http://404media.co>>.

intricacy.<sup>42</sup>

Mastering multiple languages is a complex task due to cognitive and practical limitations associated with the scarcity of time and attention. Humans typically find it challenging to manage several linguistic systems concurrently. Additionally, achieving fluency across several languages requires consistent exposure and practice, which becomes arduous with an increasing number of languages. Despite our acknowledged linguistic adaptability, the simultaneous mastery of multiple languages is inherently constrained.<sup>43</sup>

Legal professionals, like all humans, are mostly limited to the material they can read in the languages they speak. Hence, a Canadian or an American judge is unlikely to cite a German or a Mongolian court, even where an excellent case that can be immensely helpful and is precisely on point exists.<sup>44</sup> The proposed legal system foresees digitization encompassing virtually all textual legal information in all languages. That is, we imagine a future in which accurately translating legal data from one language to another will become effortless and seamless, and language will no longer be a significant limitation that causes distrust or perpetuates tunnel vision.<sup>45</sup> Though translation of legal language may pose more problems than some other language translation tasks,<sup>46</sup> we expect this challenge to be overcome.

One might question our prediction that technological tools will enable the translation of legal materials in numerous languages. Language translation is a complex and intricate task that goes beyond the mere substitution of words from one language into another.<sup>47</sup> Humans use language in nuanced and diverse ways. Words have different meanings in different contexts, and domain-specific jargon—such as legal jargon—exacerbates this sensitivity to context. Moreover, translation involves a deep understanding of both the source and target languages, as well as the cultural nuances, idioms, and context in which the text is situated. Syntax, semantics, and even the tone can vary significantly between languages, making it challenging to achieve an accurate and culturally sensitive translation. Additionally, certain concepts or phrases may exist in one language but have no direct equivalent in another, requiring the translator to find innovative ways to convey the intended meaning. Consequently, the complexity of language translation often necessitates not just linguistic expertise but also cultural awareness and a nuanced understanding of the subject matter.

However, advancements in translation technologies make our assumptions regarding AI's future language capabilities realistic. The technology regarding language translations is constantly evolving, with improvements in machine translation and the integration of AI playing a significant role. AI-powered machine translation systems use algorithms and neural networks to automatically translate text from one language to another. AI tools already offer

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<sup>42</sup> For a general interesting discussion see Guy Deutscher, *Through the Language Glass: Why the World Looks Different in Other Languages* (New York: Metropolitan Books, 2010).

<sup>43</sup> See for example, Elissa L Newport, "Maturational Constraints on Language Learning" (1990) 14:1 *Cognitive Science* 11.

<sup>44</sup> Of course, other reasons may prevent judges from citing foreign cases, including low precedential weight and varying cultural, institutional, and societal norms. However, this does not negate the potential for learning from other jurisdictions and benefiting from others' insights and solutions when appropriate.

<sup>45</sup> On the impact of language barriers on trust see generally Helene Tenzer, Markus Pudelko & Anne-Wil Harzing, "The Impact of Language Barriers on Trust Formation in Multinational Teams" (2017) 45:5 *Journal of International Business Studies* 508.

<sup>46</sup> Ran Hirschl, "The Question of Case Selection in Comparative Constitutional Law" (2005) 53:1 *Am J Comp L* 125.

<sup>47</sup> Lawrence Venuti, ed, *The Translation Studies Reader*, 4th ed (Oxfordshire, UK: Routledge, 2021).

researchers the ability to “translate as you write.”<sup>48</sup> GPT-4, for instance, can work at a high level with English, Spanish, French, German, Chinese, Japanese, Korean, Russian, Italian, Dutch, Portuguese, Arabic, and others.<sup>49</sup> Research-tailored AI tools already boast their capacity to “support searching in over 100 different languages.”<sup>50</sup>

More generally, technological tools can already process large volumes of text quickly, making them efficient for certain translation tasks. LLMs like GPT-4 and BERT have shown impressive results in language translation tasks, although they have not been specifically designed for this purpose.<sup>51</sup> These models are trained on vast amounts of text data and can generate human-like text, which includes translating sentences into different languages. There

<sup>48</sup> To illustrate, one platform currently prompts users to “Go ahead and use the handy Translation feature... Type out your text in the language you’re using and highlight it ... [our AI] detects that the text is not in English and offers an accurate English translation that can be copied and used as needed.” See Dyanne Fernandes, “Language Editing Tools for Researchers: 5 Reasons to Choose Paperpal” (16 February 2023), online: Paperpal Blog <<http://paperpal.com>>.

<sup>49</sup> On November 5, 2023, we asked GPT-4, “How many languages can you work with and translate into and from?” It responded with the list of languages named above. We then asked, “Can you please translate my original question into each of those named languages, as well as 20 others?” and it responded as follows: “Certainly, here is the translation of your original question, ‘How many languages can you work with and translate into and from?’ into the 12 languages I mentioned, followed by 20 additional languages:

1. Spanish: ¿Con cuántos idiomas puedes trabajar y traducir de y hacia ellos?
  2. French: Avec combien de langues pouvez-vous travailler et traduire de et vers celles-ci?
  3. German: Mit wie vielen Sprachen können Sie arbeiten und in diese und aus diesen übersetzen?
  4. Chinese (Simplified): 你可以使用多少种语言进行工作，并进行翻译？
  5. Japanese: あなたは何言語で作業し、それらの言語に翻訳することができますか？
  6. Korean: 얼마나 많은 언어로 작업하고 번역할 수 있습니까?
  7. Russian: Сколько языков вы можете использовать и переводить на них и с них?
  8. Italian: Con quante lingue puoi lavorare e tradurre da e verso di esse?
  9. Dutch: Met hoeveel talen kunt u werken en vertalen naar en van deze talen?
  10. Portuguese: Com quantas línguas você pode trabalhar e traduzir para e delas?
  11. Arabic: مع كم لغة يمكنك العمل والترجمة منها وإليها؟
  12. Swedish: Med hur många språk kan du arbeta och översätta till och från dem?
- Additional 20 languages:
13. Turkish: Kaç dil ile çalışabilir ve bu dillerden ve bu dillere çeviri yapabilirsiniz?
  14. Greek: Με πόσες γλώσσες μπορείτε να εργαστείτε και να μεταφράσετε από και προς αυτές;
  15. Polish: Z iloma językami możesz pracować i tłumaczyć na nie i z nich?
  16. Czech: S kolika jazyky můžete pracovat a překládat je do nich a z nich?
  17. Hungarian: Hány nyelven tudsz dolgozni és fordítani ezekre és ezekről?
  18. Finnish: Kuinka monella kielellä voit työskennellä ja kääntää niistä ja niihin?
  19. Danish: Hvor mange sprog kan du arbejde med og oversætte til og fra?
  20. Norwegian: Hvor mange språk kan du jobbe med og oversette til og fra?
  21. Romanian: Cu câte limbi puteţi lucra şi traduce din şi în acestea?
  22. Bulgarian: С колко езика можете да работите и да превеждате от и към тях?
  23. Ukrainian: З якою кількістю мов ви можете працювати та перекладати з них та на них?
  24. Slovak: S koľkými jazykmi môžete pracovať a prekladať z nich a do nich?
  25. Lithuanian: Su kiek kalbų galite dirbti ir versti iš jų ir į jas?
  26. Latvian: Ar cik valodām jūs varat strādāt un tulkot no tām un uz tām?
  27. Estonian: Mitme keelega saate töötada ja neist tõlkida?
  28. Croatian: S koliko jezika možete raditi i prevoditi s njih i na njih?
  29. Serbian: Sa koliko jezika možete raditi i prevoditi sa njih i na njih?
  30. Slovenian: S koliko jeziki lahko delate in prevajate iz njih in v njih?
  31. Hebrew: עם כמה שפות אתה יכול לעבוד ולתרגם אליהן ומתן?
  32. Thai: คุณสามารถทำงานกับภาษาใดก็ได้ที่ภาษาและแปลเข้าและออกจากภาษาเหล่านั้น?

Let me know if you need any additional assistance!”

<sup>50</sup> Email from Consensus, an AI research tool, to authors (20 March 2024).

<sup>51</sup> Jingfeng Yang et al, “Harnessing the Power of LLMs in Practice: A Survey on ChatGPT and Beyond” (28 February 2024), online: ACM Transactions on Knowledge Discovery from Data <<http://dl.acm.org>>.

are also multilingual models like M2M-100 from Meta, which can translate directly between 100 languages without using English as a go-between. Similarly, Google's PaLM 2 model is trained on hundreds of languages using parallel text data.

If designed intentionally to include under-represented languages and dialects, multilingual generative AI could help to give marginalized groups and indigenous communities a stronger voice in legally dominant languages and thereby improve their access to various legal mechanisms to protect their rights.<sup>52</sup> It could generate localized content, translate information accessibly, and enable cross-cultural dialogues online for linguistic minorities. However, truly inclusive design requires addressing the root causes of data poverty for marginalized groups, deliberately sourcing diverse, high-quality training data, and rigorous training. Equitable access, training data diversity, cultural sensitivity, and localized testing would probably be essential to realizing the potential benefits for vulnerable communities. Overall, training LLMs on numerous languages is a significant step towards breaking down the language barrier, especially for low-resource languages.

Whereas LLMs are not designed specifically for translation tasks, other tools are more tailored for translations. Prominently, Neural Machine Translation (NMT) uses deep learning techniques to improve translation quality.<sup>53</sup> Attention mechanisms, which weigh the importance of different words in a sentence when translating, have led to more accurate and contextually appropriate translations.<sup>54</sup> Transformer-based NMT models are trained on vast amounts of multilingual data, allowing them to learn patterns and focus on specific parts of the input/output sentences, thereby improving translation performance. In all, NMT has shown promising results in capturing the nuances of language and producing more accurate translations.

One of the challenges in machine translation is capturing the contextual meaning of words and phrases. This is particularly relevant to translating legal texts, which typically contain jargon and nuances. Current technology aims to improve contextual understanding by incorporating complex algorithms and language models. This helps in producing more accurate and contextually appropriate translations. Furthermore, advanced systems allow for customization and adaptation to specific domains or industries.<sup>55</sup> Training the translation models on domain-specific data, such as legal or medical texts, enhances the quality and accuracy of translations for specialized fields.

While machine translation has its advantages, the human touch remains (for now) crucial for high-quality translations in highly specialized domains.<sup>56</sup> Human translators can understand and address current events, humour and emotions, and usage trends in the respective country or linguistic community, which machines sometimes struggle with currently. Nonetheless, with the rapid advancement in technology and training, we expect that human input in the translation

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<sup>52</sup> And compare Bronwyn Carlson & Peita Richards, "Indigenous Knowledges Informing 'Machine Learning' Could Prevent Stolen Art and Other Culturally Unsafe AI Practices" (8 September 2023), online: The Conversation <<http://theconversation.com>>.

<sup>53</sup> For an influential discussion see Dzmitry Bahdanau, Kyunghyun Cho & Yoshua Bengio, "Neural Machine Translation by Jointly Learning to Align and Translate" (Paper delivered at the International Conference on Learning Representations, 2015).

<sup>54</sup> See Ashish Vaswani et al, "Attention is All You Need" in U Von Luxburg et al, eds, *Advances in Neural Information Processing Systems* (La Jolla, CA: Neural Information Processing Systems Foundation, 2017) 5998.

<sup>55</sup> Qing Lyu et al, "Translating Radiology Reports into Plain Language Using ChatGPT and GPT-4 with Prompt Learning: Results, Limitations, and Potential" (2023) 6:9 Visual Computing for Industry, Biomedicine & Art 1.

<sup>56</sup> Camilla J Martinez & Tiffani A Mezitis, "Harvard Business School partners with BCG on AI productivity study" (13 October 2023) online: The Harvard Crimson <<http://www.thecrimson.com>>.

domain will become much less important in the years to come. Models are getting larger (currently, many billions of parameters) and pre-trained on ever-growing multilingual datasets, enhancing performance across domains. Using monolingual corpora in both languages, unsupervised NMT methods can generate reasonable quality translations without parallel training data. Impressively, multilingual models can perform competent translation between any language pair, even those never encountered during training.

Speech translation systems can already provide simultaneous spoken language conversion on devices, like the fictional, universally translating Babel fish from Douglas Adams' 1979 novel, *The Hitchhiker's Guide to the Galaxy*.<sup>57</sup> Evaluation remains challenging as automated metrics still do not perfectly align with human judgments of quality. Yet, custom domain-specific models continue to see development for technical applications requiring nuanced translations. Accordingly, there are reasons to believe that the importance of human input will diminish with time as technological developments spur further performance improvements in language translation.

LexOptima's cross-language data availability will go beyond quantity, quality, and efficiency. In fact, it has the potential to make our legal systems more equitable, diverse, and inclusive. Judges and legislators currently narrow the scope of information and perspectives considered to those available within the scope of their language abilities, thereby excluding valuable insights expressed in other languages. Not being able to readily consider insights and opinions in multiple languages ignores the cultural and linguistic diversity that exists globally and within many societies.<sup>58</sup> Our human inability to master manifold languages limits us and, at its worst, can lead us to perpetually misperceive reality, reproduce bias, be unaware of our blind spots, and generally contribute to ongoing injustice.

When making decisions or analyses that could impact others from different linguistic backgrounds, limiting information to solely one's own language (or languages) can lead us to disregard relevant local knowledge, cultural heritage, social conventions, and stakeholder input. Moreover, not accounting for multilingual sources can miss key facts, data, theories, or alternative frameworks embodied in other languages. In an increasingly interconnected world, such an inward focus risks failing to recognize important international discussions or advancements. Even if ultimately a polity prefers to 'go its own way,' it can still be valuable to understand how and why other polities elsewhere in space and time may have chosen to proceed otherwise. Encompassing numerous languages, an AI-enabled legal system will be less susceptible to such limitations, making many concerns surrounding ignorance largely outdated.

Integrating traditional legal data is a natural but profound first step forward. A data-driven approach incorporating vast traditional and novel legal information and data sources, powered by continuously evolving computational capabilities, can help address long-standing human cognitive limitations and inform more capable legal frameworks. The digitization of enormous arrays of legal information, the use of machine learning techniques, and the breaking down of language barriers will pave the way for legal systems that are more inclusive and comprehensive. This portends the dawn of a new computational era in legal practice and governance, where data and technology together serve as the lifeblood of the law.

While challenges remain, particularly around the nuances of machine translation and the preservation of human insight, the potential benefits of ongoing technological advancement are

<sup>57</sup> Douglas Adams, *The Hitchhiker's Guide to the Galaxy* (New York: Harmony Books, 1979).

<sup>58</sup> Of course, this is not an easy problem to overcome. See, for example, Ran Hirschl, "The Question of Case Selection in Comparative Constitutional Law," (2005) 53 *American Journal of Comparative Law* 125.

undeniable. Vast legal data will have a central role in facilitating legal predictions, informing legal services, and thereby improving the quality of legal outcomes and access to justice.<sup>59</sup> This multi-language and data-driven shift will transform how we understand and apply the law and influence our worldviews and social norms.

## B. Macro Extralegal Data

Oliver Wendell Holmes Jr. famously remarked that “The life of the law has not been logic: it has been experience.”<sup>60</sup> Indeed, law does not exist in a vacuum. As Figure 1 above illustrates, legal systems constantly interact with social realities and various data types. Law is interwoven with a multitude of other domains, each influencing and influenced by legal principles and practices.<sup>61</sup>

Understanding the law necessitates a holistic perspective that acknowledges the intricate tapestry of, among other things, societal, economic, psychological, philosophical, political, and historical contexts within which law operates. For instance, the financial regulations introduced after the 2008 global financial crisis are not best seen as decontextualized legal creations; they were responses to economic forces, political demand, financial realities, and historical lessons. As another example, the approach to criminal punishment is heavily influenced by perceptions of moral responsibility, free will, human behaviour, incentives, cultural norms, political ideology, and socio-economic realities. This interconnectedness between law and other domains underscores the need for an expansive view of data that extends beyond traditional legal boundaries.

Along these lines, interdisciplinary legal scholarship is pivotal in enriching our understanding of law. By integrating insights from diverse domains such as economics, political science, history, psychology, gender studies, philosophy, criminology, sociology, anthropology, computer science, and environmental studies, interdisciplinary scholarship can help uncover the multi-dimensional nature of legal systems. It provides perspectives and insights that are relevant to the optimal design and evolution of legal rules and institutions. For instance, a study of intellectual property law can benefit immensely from an understanding of technological advancements and market dynamics. Similarly, the study of international law can be deepened and enriched by incorporating geopolitical analysis, historical context, and international relations theory. Through such cross-disciplinary perspectives, we can reveal the complex forces that shape legal regimes and their impacts and how to improve them.<sup>62</sup>

Similarly, economic data, such as Gross Domestic Product (GDP), employment rates, and inflation, can significantly influence law and policymaking. For instance, governments often adjust labour laws during economic downturns to protect jobs and stimulate economic activity. At the same time, financial data, including market trends and financial stability indicators, can guide the formulation of financial regulations. An example from the United States is the Dodd-Frank Act, shaped by financial data revealing systemic risks in the banking industry. Historical data and contexts also shape important parts of our legal systems. For instance, constitutions and constitutional law principles often bear the imprint of a nation’s history, including periods of conflict, colonialism, or significant social change such as women’s suffrage, the abolition of

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<sup>59</sup> See for example, Daniel Martin Katz, “Quantitative Legal Prediction – or – How I Learned to Stop Worrying and Start Preparing for the Data-Driven Future of the Legal Services Industry” (2012) 62 Emory LJ 909.

<sup>60</sup> Oliver Wendell Holmes Jr, *The Common Law. Vol. I.* (Boston: Little, Brown and Company, 1881) at 1.

<sup>61</sup> See for example, Robert C Clark, “The Interdisciplinary Study of Legal Evolution” (1981) 90:5 Yale LJ 1238; Matyas Bodig, “Legal Doctrinal Scholarship and Interdisciplinary Engagement” (2015) 8:2 Erasmus L Rev 43.

<sup>62</sup> See for example, Anne-Marie Slaughter, Andrew S Tulumello & Stepan Wood, “International Law and International Relations Theory: A New Generation of Interdisciplinary Scholarship” (1998) 92:3 Am J Intl L 367.

slavery, or the protection of Indigenous rights.

The proposed system acknowledges the importance of extralegal information and insight and would seek to incorporate all relevant and available high-quality data. By combining these broader sources of data, LexOptima could generate rules that better fit the realities of our interconnected world. For example, data-driven insights could inform the creation of more flexible labour laws that adapt to technological disruptions, extreme weather events, and new privacy threats. Similarly, a data-informed approach to environmental regulation could allow for more proactive and effective responses to the unfolding climate crisis.

More generally, the world is changing at a rapid pace, with technological advancements and social developments accelerating. However, the legal system has frequently struggled to keep up with these changes, often leading to gaps between the law and reality. Legislators, judges, and policymakers follow rigid, thorough, and detailed procedures. Whereas this can be beneficial (for example, to ensure that changes are gradual and measured), it can also obstruct legal development and may result in the perseverance and perpetuation of inadequate regulations and rules.<sup>63</sup> As a result, there is a growing need for a more flexible and adaptive legal system to keep up with the changing realities of the modern world.<sup>64</sup>

A data-driven approach will advance more responsive laws, rules, enforcement efforts and judicial decisions that better reflect specific circumstances and needs. For instance, data on local economic conditions and social norms could inform the crafting of community-specific regulations that promote economic development while respecting cultural practices. On a larger scale, data on regional political dynamics and historical contexts could guide the formation of laws, treaties, conventions, protocols, and agreements that foster cooperation and stability among nations. This approach embraces the complexity and diversity of our world, enabling the creation of legal systems that can better serve humanity. We return to this point with further concrete examples in Part IV below.

### C. Micro Extralegal Data

On the other end of the data spectrum, micro extralegal data brings an individual perspective into the equation. In today's digital age, individuals generate vast amounts of personal data. These data, produced consciously and unconsciously, are a byproduct of constant digital interactions and activities. Examples include internet browsing histories, social media interactions, online purchase records, GPS location data, and health information from wearable fitness trackers. Beyond these, every digital communication leaves a digital breadcrumb or fingerprint, including emails and text messages, comments posted online, video calls, internet searches, exchanges with LLMs, and so on. LexOptima could potentially incorporate the volumes of personal data that individuals produce. Setting aside the obvious and important privacy implications (discussed below), one must consider the possibilities relating to pervasive and deep individualized data creation and capture.

Let us be clear about our approach. We advocate here to incorporate data and analysis of non-private, anonymized individual data that are *already available in the public sphere*. We do not side with any camp in the debate over users' privacy and data regulation. Our claim here is more modest: an AI-enabled system should use all personal and private information to the extent it is permissible. Society needs to balance competing considerations when regulating

<sup>63</sup> See for example, Shmuel I Becher, "Key Lessons for the Design of Consumer Protection Legislation" in Klaus Mathis & Avishalom Tor, eds, *Law and Economics of Regulation* (Cham: Springer International Publishing, 2021) 73.

<sup>64</sup> Jonathan H Choi, Amy Monahan & Daniel Schwarz, "Lawyering in the Age of Artificial Intelligence" (9 November 2023), online: Social Science Research Network <<http://papers.ssrn.com>>.

data, privacy, and security.<sup>65</sup> Whatever this balance implies, our intended system merely seeks to use what society regards as acceptable; indeed, it will be a key element of social collective determination of the extent of sharing such data. The normative judgement on how to strike the balance and the debate about whether current privacy protections are adequate are separate issues beyond the scope of our analysis. Here, we simply opine that once the data are already (legitimately) made available, the system should make beneficial use of it.

The ubiquity and volume of personal data generation are projected to escalate dramatically in the coming years, driven by the proliferation of Internet of Things (IoT) devices and the deepening integration of digital technologies into daily life. For example, future smart homes may feature data-collecting appliances such as smart toilets, which could monitor human waste to provide invaluable real-time health insights. Similarly, smart refrigerators could track eating habits and nutritional intake by analyzing the type and frequency of stored food items. Besides, smart cars provide information on driving habits and behaviours, risk-taking, and places visited. The burgeoning field of sleep technology, incorporating devices such as smart mattresses and sleep trackers, might offer granular data on sleep patterns, quality, and disturbances. In the realm of cognitive health, wearable devices that monitor brain activity could become commonplace, offering insights into mental states and neurological activity.

The scope of future data generation could extend further and well beyond conventional boundaries as technology continues to evolve. As Augmented Reality (AR), Virtual Reality (VR) and Extended Reality (ER) data technologies become more mainstream, they will generate a wealth of data on user interactions, behaviours, and reactions in the virtual world. On another front, advances in biometric technologies could lead to more widespread use of voice and facial recognition, and even gait analysis, generating unique personal data. Technologies could capture and understand human emotions through techniques like sentiment analysis, facial coding, and biometric indicators. This could lead to the generation of ‘emotional data,’ which could be used in various areas within and outside the law. As concerns around sustainability and the environment grow, more devices will be designed to monitor our environmental impact. These could include smart meters that track energy usage, devices that measure carbon footprint, or apps that track water consumption. As a final example, with the advancements in genome sequencing and testing, many more people will have their genetic data stored, shared, and analyzed.<sup>66</sup>

These examples represent just a snapshot of the potential future of personal data, highlighting the increasingly diverse, broad, and intimate nature of the information that individuals will generate and leave behind. Combined, when collected and analyzed, these data trails can reveal intricate patterns of individual behaviour and preferences. This, in turn, will produce more knowledge that can generate significant benefits, such as personalized healthcare, enhanced lifestyle convenience, and improvements in overall well-being. It will also promise progress in important public domains such as sustainability and climate change, public health, and food security, which could improve our laws and legal systems.

Before illustrating more concretely how an AI-enabled legal system could benefit from these new types of data, we must first acknowledge an imperative concern: As the volume and

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<sup>65</sup> See, for example, Ignacio Cofone, *The Privacy Fallacy: Harm and Power in the Information Economy* (Cambridge University Press, 2023).

<sup>66</sup> See for example, Shmuel I Becher & Andelka M Phillips, “Data Rights and Consumer Contracts: The Case of Personal Genomic Services” in Damian Clifford, Jeannie Paterson & Kwan Ho Lau, eds, *Data Rights and Private Law* (Hart Publishing, 2023) 83.

variety of personal data continue to expand, several potential risks come to the fore.<sup>67</sup> For starters, the collection of intimate data, such as biometric or emotional data, can infringe upon an individual's personal life if misused. More generally, the combination of vast personal information can lead to unwanted surveillance, facilitating the ability to monitor individuals' behaviours, movements, and perhaps thoughts, to an unprecedented degree. Security is another critical issue, as storing vast amounts of sensitive data presents attractive targets for bad actors, such as cybercriminals and terrorists. Data breaches can lead to identity theft, financial loss, and the exposure of personal information.

Even more profoundly, the ubiquitous data collection can undermine individual autonomy and mastery.<sup>68</sup> Algorithmic decision-making based on personal data can steer individuals' choices and behaviours, often without their explicit knowledge or consent. This can lead to 'digital paternalism,' where data-driven recommendations and nudges subtly erode individuals' control over their lives.

Commodifying personal data also raises ethical and equity issues, as individuals often generate valuable data without even being aware of its subsequent use. Moreover, the risks associated with personal data collection and aggregation extend to communities and groups. Aggregated data can be used for discriminatory practices, like digital redlining or predictive policing, which can reinforce social inequalities.<sup>69</sup> Besides, cultural or community-specific information can be exploited or misrepresented, compromising group identity, shared values, and collective privacy.

Ample literature discusses and debates these concerns, which extend to the operation of LexOptima. For example, the "privacy paradox" is a social phenomenon that pertains to the discrepancy between individuals' stated concerns about privacy and their actual online behaviours.<sup>70</sup> Despite expressing anxiety about privacy, people often share vast amounts of personal information online and fail to use available privacy protection measures. They indifferently accept lengthy, complex privacy policies without reading them. They also disclose sensitive personal details on social media platforms, online shopping sites, and through other digital services.

Nonetheless, many opine that the privacy paradox does not entail a carte blanche for firms, institutions, or governments to use personal information, nor does it legitimize the current levels of privacy protection.<sup>71</sup> According to this logic, this paradox can be attributed to several factors. The convenience and immediate gratification offered by online services and platforms often overshadow privacy concerns. Moreover, the complexities of data practices and privacy policies may lead to a sense of resignation or lack of control among users. Finally, the abstract and often delayed nature of privacy risks can make them seem less immediate compared to the tangible benefits of digital services. Hence, one may legitimately question a legal system that

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<sup>67</sup> See the seminal book Shoshana Zuboff, "The Age of Surveillance Capitalism" in Wesley Longhofer & Daniel Winchester, eds, *Social Theory Re-Wired* (New York: Routledge, 2018) 203.

<sup>68</sup> See Theresa Payton & Ted Claypoole, *Privacy in the Age of Big Data: Recognizing Threats, Defending Your Rights, and Protecting Your Family* (Washington: Rowman & Littlefield, 2014).

<sup>69</sup> Compare Salomé Viljoen, "A Relational Theory of Data Governance" (2021) 131 Yale LJ 573.

<sup>70</sup> See Spyros Kokolakis, "Privacy Attitudes and Privacy Behaviour: A Review of Current Research on the Privacy Paradox Phenomenon" (2017) 64 Computers & Security 122.

<sup>71</sup> Saravanan Gurumurthy, "Stop Using the Privacy Paradox as an Excuse to Avoid Privacy by Design" (28 September 2022), online: ISACA <<http://www.isaca.org>>; Mauro Luis Gotsch & Marcus Schögel, "Addressing the Privacy Paradox on the Organizational Level: Review and Future Directions" (2021) 73 Management Rev Q 263; see also Jurgen Williams et al, "AI-Driven Public Services and the Privacy Paradox: Do Citizens Really Care About Their Privacy?" (2023) 25:11 Public Management Rev 2116.

seeks to be ‘decent’ yet benefits from users’ manipulation.

Recalling the disclaimer above that the system should ethically use publicly acceptable, non-private data for societal benefit, and without entering the debate on privacy regulation adequacy one way or another, we now turn to illustrate how it could use and incorporate personal data. For brevity, we focus on two important examples: Personalized law and using microdata to decode law.

### Personalized law

“If, for instance, a man is born hasty and awkward, is always having accidents and hurting himself or his neighbors, no doubt his congenital defects will be allowed for in the courts of Heaven, but his slips are no less troublesome to his neighbors than if they sprang from guilty neglect.”<sup>72</sup>

– Oliver Wendell Holmes Jr.

The idea that the law can facilitate personalization and advance one’s preferences is not novel. Contract law, for example, allows contracting parties to personalize their agreements and—within some boundaries—design the features of the transactions they undertake. Along these lines, contract law also provides contracting parties with default rules that can economize on their scarce resources and reduce transaction costs.<sup>73</sup> For some contracting parties, adhering to well-crafted defaults that align with their preference makes perfect sense.

However, these default rules are likely to be general in nature and apply broadly. Slightly restated, contracting parties may have heterogeneous preferences, and one size (of a default rule) will not fit all, or even many. To be efficient and anticipate the parties’ preferences, rule-makers ought to determine the parties’ specific needs. The more nuanced these default rules are, the more these rules seem to necessitate onerous empirical research into what contracting parties value and prefer.<sup>74</sup> At the same time, individuals have limited interest, ability, and incentive to tell the law precisely how it should treat them. It is frequently emphasized that essentially complete contracts are impossible (though we wonder for how much longer).

Personalized law responds to the reality of the costliness of contracting. It posits that much of the necessary information for creating more tailored legal rules is already, in fact, being produced routinely in the form of data. If such data are indeed available, rules can be crafted in a more personal way.

In private law, the idea that individuals are held to a law built around their characteristics, preferences, and choices—as revealed in available data pertaining to these individuals—seems intuitively appealing. Thus, for instance, Seligman calls for a so-called “personalized choice of private law.”<sup>75</sup> Under this proposed framework, one’s chosen preference—for example, to avoid mandatory arbitration clauses in employment contracts—could be recorded in a ‘Do Not Arbitrate’ registry. Once this is recorded, according to this proposal, the individual’s stated preference is automatically incorporated into a contract, potentially giving the individual greater agency and control over their legal choices. Under this suggested regime, firms could

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<sup>72</sup> Holmes, *supra* note 60 at 108.

<sup>73</sup> See for example, Ian Ayres, “Preliminary Thoughts on Optimal Tailoring of Contractual Rules” (1993) 3 S Cal Interdisciplinary LJ 1.

<sup>74</sup> *Ibid.*

<sup>75</sup> See Matthew A Seligman, “Personalized Choice of Private Law” (2021) Cardozo Legal Studies Research Paper No 596 [working paper].

attach different prices to different contracts (for example, charging individuals who opt out of mandatory arbitration higher prices).

Another example is the case of disclosures. Personally tailored health and product warnings can consider the consumer's knowledge, capacity, medical history, and literacy. Such tailoring could improve consumer understanding and decision-making and shield manufacturers from undue liability. Negligence law provides another illustration. Here, a nebulous 'reasonable person' standard of care would be replaced with a hypothetical individual that closely aligns with—read: impersonates—the alleged tortfeasor, considering her personal characteristics, skills, and abilities.<sup>76</sup> Relatedly, Niblett and Casey assert that general legal norms as we know them today will cease to exist once lawmakers can produce endlessly specific, complex micro-directives tailored and communicated to the individual.<sup>77</sup>

Personalized law portends radical changes for law and society, and whether those changes are worth pursuing is yet to be determined. For instance, Endicott and Yeung opine that data-driven legal personalization may not be legitimate if it does not adequately accord individuals and public institutions with agency, which is intertwined with the rule of law.<sup>78</sup> Personalized law may violate or conflict with other well-established democratic norms, offend equality and undermine a shared sense of the meaning of citizenship.

Personalized law (and as we will see below, LexOptima) would have to navigate the splintering of the rule of law into many *rules* of law. As a result, the concept of judicial precedent would change dramatically; personalized law may be more widely applied where precedent is not particularly determinative. Ben-Shahar and Porat suggest that this hyper-granularization could be circumvented with crude personalization, where the law treats people differently along only a few bright lines that are easier to identify and navigate.<sup>79</sup> Whether to split the public into three, four or millions of publics would be yet another perennial political question. This is perhaps one of the most important lessons for the AI-enabled legal system we describe.

In either case, personalized law does not entail the death of generalization. Unless personalized law would achieve next to infinite granularity, one must consider the 'relevant' criteria for comparing an individual to a reasonable doppelgänger. That there is a comparison reflects that the law will continue to generalize—at least on some level.<sup>80</sup> True, the law may largely move from a coherent body of rules governing a community (e.g., an entire nation with numerous individuals) to commands directed at the individual and the individual alone. That said, one should not ignore the value of generalization as a deliberate policy choice or tool.

Often, a more generalized law intentionally aims to project norms and hold an individual to a community standard. Accordingly, balancing personalization and generalization necessitates differentiating between desirable and undesirable personalization or generalization. Personalized law can help paint a more accurate picture of the community and be more efficient and fairer. Nonetheless, we acknowledge that this data-driven picture may

<sup>76</sup> Omri Ben-Shahar & Ariel Porat, "Personalizing Negligence Law" in Christoph Busch & Alberto De Franceschi, eds, *Algorithmic Regulation and Personalized Law: A Handbook* (London: Bloomsbury, 2021) 54.

<sup>77</sup> Anthony J Casey & Anthony Niblett, "The Death of Rules and Standards" (2017) 92:4 Indiana LJ 1401.

<sup>78</sup> Timothy Endicott & Karen Yeung, "The Death of Law? Computationally Personalized Norms and the Rule of Law" (2022) 72:4 UTLJ 373.

<sup>79</sup> Adam Davidson, "Personalized Law, Political Power, and the Dangerous Few" [2022] U Chicago L Rev Online 1.

<sup>80</sup> Sandra G Mayson, "But What *Is* Personalized Law?" [2022] U Chicago L Rev Online 1.

not always be normatively desired and can suffer from gaps and biases.<sup>81</sup>

Importantly, applying either a crude or sophisticated personalized law to areas implicating personal autonomy and privacy rights is a fraught proposition. In such legal contexts, people naturally desire a high degree of choice. Yet, in some sense, the wealth of data they produce before they reach the court will have already spoken for them. This is especially so when the data represent a more reliable reflection of one's preferences than what they may purport to believe inwardly.

In one particularly problematic example, Ben-Shahar and Strahilevitz consider the topic of organ donation. They suggest that a society with a compulsory organ donation program could, by default, exempt Shinto practitioners. To be more granular, one could exempt vegan practitioners of Shinto, or maybe Shinto practitioners who are vegan and aged between 45 and 60. The granularity spectrum is rather wide and ends with a composite that probably has captured one's preferences on the question.<sup>82</sup> One may believe that data-informed default rules could be permitted to evolve into presumptions and maybe, eventually, into mandates. Nonetheless, it is questionable that a combination of externally manifested data-points-cum-descriptors—in this case, one's religion, diet, and age—could (descriptively) or should (normatively) anticipate the inner preferences of individuals on unanticipated questions of significant stakes.

Generalization and personalization each have their pros and cons. On the one side of the spectrum, societies may opt to have generalized yet politicized and inefficient laws. In many ways, this is our current state. On the other side of the spectrum, technological developments may offer the opportunity to change the nature of our laws, making them granular, specific, dynamic, and efficient.<sup>83</sup> Facing this dilemma, the system should use available and robust data that may shed more accurate light on people's preferences and values. But as detailed below, it would also pursue participatory-enhancing mechanisms to verify and update the system's assumptions and predictions.

### **Decoding law with microdata**

Whereas the discussion above emphasizes the role that micro extralegal data can play in advancing more tailored and personalized laws, there are additional vital ways in which such data can be helpful. To see that, let us move from the personal level to the aggregate one. Here, extensive personal yet possibly anonymized information collected from multiple parties can help legislators, regulators, and judges better design and apply legal principles.

Consider, for instance, the case of dark patterns and consumer manipulation. Dark patterns are deceptive user interfaces designed to manipulate or coerce people into taking actions they may not intend, like making purchases or signing up for recurring subscriptions.<sup>84</sup> Dark patterns exploit psychological vulnerabilities and nudges to mislead users or trick them into making decisions that benefit companies but are contrary to the users' best interests. These tactics can include deceptive interfaces, hidden information, and social pressure techniques, all aimed at

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<sup>81</sup> *Ibid.*

<sup>82</sup> Ben-Shahar & Porat, *supra* note 76 at 5-53.

<sup>83</sup> For example, consumers could use AI-tools to summarize, simplify, personalize, and identify risks in standardized legal texts such as consumer contracts and privacy policies. See Yonathan A Arbel & Shmuel I Becher, "How Smart are Smart Readers? LLMs and the Future of the No-Reading Problem" in Stacy-Ann Elvy & Nancy Kim, eds, *The Cambridge Handbook on Emerging Issues at the Intersection of Commercial Law and Technology* (forthcoming 2024).

<sup>84</sup> See Arunesh Mathur et al, "Dark Patterns at Scale: Findings from a Crawl of 11K Shopping Websites" (2019) 3:1 Proceedings of the ACM on Human-Computer Interaction 1.

tricking users into making imperfectly intended (if not unintended) and potentially harmful decisions. Hence, dark patterns undermine consumer autonomy and choice, leading to unethical and unfair practices prioritizing the company's interests over user well-being.<sup>85</sup>

Despite their prevalence and harm, proving and quantifying the existence of dark patterns can be challenging for various reasons. First, defining what constitutes a dark pattern can be subjective. Different individuals may have varying interpretations of what qualifies as a dark pattern. This subjectivity makes it difficult to establish a universally accepted definition and criteria for identifying dark patterns. Slightly restated, there are open questions about where to draw the line between ethical persuasion techniques and exploitative manipulation.

Relatedly, there is currently no standardized metric or measurement framework to quantify the prevalence of dark patterns. Without a consistent and widely accepted method, it becomes challenging to compare and analyze the extent to which dark patterns are used across different platforms and applications and how they impact users. Furthermore, dark patterns can evolve over time as designers devise new techniques to manipulate users. This dynamic nature makes it difficult to keep up with the latest dark pattern trends and identify them accurately.

Moreover, proving the existence of dark patterns often requires access to the design process and decision-making behind user interfaces (assuming these interfaces have not themselves been the product of an automated, iterated design process tuned to optimize user purchase behaviour).<sup>86</sup> Information relating to the design of systems is usually not publicly available, making it challenging to analyze and validate the presence and harm of dark patterns. Finally, dark patterns rely on deceiving users, who are not always aware that they are being manipulated. This lack of user awareness makes it difficult to quantify the impact and effectiveness of dark patterns. Even when dark patterns seem clear, quantifying their financial or social effects at scale is challenging.

A legal system that employs extensive data collection on users' online behaviours and interactions could help policymakers, legislatures, regulators, and adjudicators counter many of these challenges. Technologies that track elements like eye movements, brain activity, purchases, time spent on pages, clicks and scrolling, and previous choices and outcomes allow insights into how users respond to interface designs in practice. These data can provide empirical evidence of the deceptive nature of certain design techniques and their adverse effects on users. For example, analyzing eye movement patterns can reveal instances where users are being misled or manipulated by specific elements on a webpage.<sup>87</sup> Similarly, tracking purchasing behaviour, emotional exploitation, visual attention and time spent on a website can help identify patterns of unintended actions resulting from manipulative design practices.<sup>88</sup>

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<sup>85</sup> For a recent discussion of the regulation of dark patterns, see Martin Brenncke, "Regulating Dark Patterns" (forthcoming 2024) 14(1) *Notre Dame Journal of International & Comparative Law*, Available at SSRN: <https://ssrn.com/abstract=4588652>.

<sup>86</sup> Jamie Luguri & Lior Jacob Strahilevitz, "Shining a Light on Dark Patterns" (2021) 13:1 *J Leg Analysis* 43.

<sup>87</sup> For studies that use such techniques see Claire Lauer & Christopher A Sanchez, "What Eye Tracking Can Show Us About How People Are Influenced by Deceptive Tactics in Line Graphs" (2023) 66:3 *IEEE Transactions on Professional Communication* 220; Jinie Pak & Lina Zhou, "Eye Gazing Behaviors in Online Deception" in *Proceedings of the Nineteenth Americas Conference on Information Systems* (Chicago, Illinois: 2013).

<sup>88</sup> For a discussion on emotional exploitation, see Christian Martin, Bärbel Christine Bissinger & Pietro Asa, "Optimizing the Digital Customer Journey – Improving User Experience by Exploiting Emotions, Personas and Situations for Individualized User Interface Adaptations" (2023) 22:5 *J Consumer Behaviour* 1050. For a discussion on general attentional differences, see Yoon Min Hwang & Kun Chang Lee, "Using an Eye-Tracking Approach to Explore Gender Differences in Visual Attention and Shopping Attitudes in an Online Shopping Environment" (2018) 34:1 *Intl J Human-Computer Interaction* 15.

This wealth of behavioural data from large user populations makes it possible to analyze subtle but meaningful differences in outcomes between groups exposed to standard designs versus those encountering potentially manipulative patterns. Techniques like A/B testing and machine learning could determine how interface tweaks influence decisions compared to natural user preferences. Aggregated across many users over time, such data offers an objective window into the real-world impacts of design changes. It may clarify which interfaces succeed in surreptitiously nudging behaviour, and how prevalent potentially exploitative designs may be.

Quantitative behavioural insights gleaned from diverse user data streams could therefore aid in establishing the existence of manipulative dark patterns and substantiating the scope of resultant individual and societal harms. While we do not purport to provide a complete and specific design of the relevant legal and empirical tests here, suffice it to say that utilizing user data would improve the ability to identify, validate, and quantify the prevalence of dark patterns, measure their impact on user experience, and highlight the potential harm they cause. An AI-enabled legal system would take this path to counter many other thorny legal issues beyond dark patterns.

#### D. Elicited Input

Society's approach to legal transformation that harnesses the power of technology will depend on prevailing perceptions about whether such a future is all but inevitable; which in turn depends on technological developments and progress in other areas influencing attitudes and beliefs about what may be possible for our legal systems. As illustrated in the previous section, we embrace the view that informational transfer between the law, on the one hand, and the individual or the community, on the other, would not necessarily require special consent from the latter. Individuals and communities might legitimately and unobjectionably communicate through many unconscious everyday choices, largely unaware of how and why the breadcrumbs of their choices will shape the nature of the laws they are subject to. However, acknowledging the risks and impediments of this type of data flow, LexOptima would seek to supplement this mostly passive and unconscious data flow with a more deliberate and conscious one. This brings us to discuss the fourth and final type of data: elicited input.

The idea that the law should represent social norms and incorporate the views of laypeople and communities where appropriate is fundamental.<sup>89</sup> While the law is centralized in its creation and enforcement, it is far from an isolated enterprise. As the discussion above emphasized, law is a multifaceted part of a dynamic system shaped and influenced by the values and opinions of the public it serves and governs.

The intersection of law and public sentiment is a complex interplay that underscores the democratic and participatory principles inherent in many legal systems. Jury trials, for example, represent a direct invocation of public opinion within the judicial process.<sup>90</sup> In jurisdictions rooted in common law, jurors—randomly selected citizens—participate directly in the judicial process by making factual determinations. Their decisions, while guided by statutory law and judicial instructions, are inevitably tinted by societal norms and values.<sup>91</sup>

Complementing this is the role of public consultations in shaping law and policy. Central

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<sup>89</sup> Bruno Deffains & Claude Fluet, "Social Norms and Legal Design" (2020) 36:1 *JL Econ & Org* 139.

<sup>90</sup> Brian H Bornstein & Edie Greene, "Jury Decision Making: Implications for and From Psychology" (2011) 20:1 *Current Directions in Psychological Science* 3.

<sup>91</sup> Tarika Daftary-Kapur, Rafale Dumas & Steven D Penrod, "Jury Decision-Making Biases and Methods to Counter Them" (2010) 15 *Leg & Crim Psychology* 133; Samuel R Sommers, "Race and the Decision Making of Juries" (2007) 12 *Leg & Crim Psychology* 171.

authorities regularly—typically crudely—solicit public input, most obviously in the form of elections, before enacting significant legislation. This iterative process of feedback and revision helps ensure that the resultant rules are legally sound and resonate with public sentiment. Besides, some jurisdictions empower citizens to directly vote on laws or constitutional amendments through referenda and ballot measures, which provides a direct pathway for public opinions to shape the law.<sup>92</sup> Among others, such referenda facilitated (or prevented) the legalization of recreational marijuana in several countries.<sup>93</sup>

The legislative process is also designed to reflect public opinion, albeit indirectly. Citizens in representative democracies elect officials to champion their interests in legislative assemblies. These representatives, at least theoretically, act in line with their constituents' wishes, thereby aligning the law with public sentiment.<sup>94</sup> The power of civil rights movements to effect legal change is another demonstration of the interplay between law and public view. When a critical mass of citizens rallies for change, they can exert significant pressure on lawmakers and courts to revise or create laws.

An AI-enabled legal system has the potential to turn this dialogue with individuals and communities into an eminent and regular feature. In a way, this brings us to the paradigm of seeing the law as an organism that some responsible party must tend to, whether that accountable party is composed of humans, machines, or some combination thereof. In any event, the law is not a perpetual motion machine that can be started once and left to its own devices.

As we integrate new modes of technologies, computation, and algorithmic power in our laws and legal institutions, we may be able to democratize the law further. This transformation may facilitate a brave new world where citizens need not participate in law only through juries, elections, referenda, or digital town halls. Instead, individuals can develop the law through their data and by readily expressing their values and beliefs. But unlike personalized law, we view the process as a two-way street: While people's aggregated behavioural data will constantly be fed into the legal system and shape law and policy, we do not discount people's desire to talk back to the law and express their beliefs and thoughts. In fact, we envisage a virtuous cycle in which data and public discourse work in tandem.

In addition to its data-driven approach, an AI-enabled legal system—aligned with its decentralization prong—would also emphasize the need for elicited input from the public. In other words, elicited input involves using technologies to actively gauge public perspectives on any legal issue. Note that this fourth type of information differs from the previous ones. Unlike the other types of data that rely on amassing existing information, this fourth type envisions *proactive* initiatives seeking input and information from the public.

The importance of this data reflects our understanding that there are and will be gaps in

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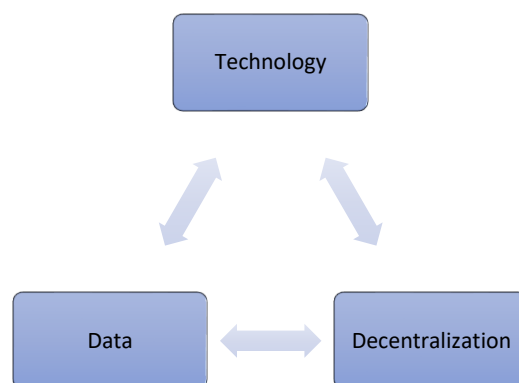
<sup>92</sup> See for example, Rory Carroll, "Irish Voters Overwhelmingly Reject Proposed Changes to Constitution", *The Guardian* (9 March 2024) online: The Guardian <<http://www.theguardian.com>>; "Switzerland Referendum: Voters Back Carbon Cuts as Glaciers Melt", *BBC* (18 June 2023) online: BBC <<http://www.bbc.com>>.

<sup>93</sup> Mona Zhang, "Ohio Becomes 24<sup>th</sup> State to Embrace Weed Legalization" (7 November 2023), online: Politico <<http://www.politico.com>>. For an example of a referendum preventing the legalization of recreational marijuana, see Eleanor Ainge Roy, "New Zealand Narrowly Votes No to Legalising Cannabis in Referendum", *The Guardian* (6 November 2020) online: The Guardian <<http://www.theguardian.com>>.

<sup>94</sup> We note here "at least theoretically" since lobbying, capture, and vested interest may skew policy and rulemaking. See Daniel Carpenter & David A Moss, eds, *Preventing Regulatory Capture: Special Interest Influence and How to Limit It* (Cambridge: Cambridge University Press, 2013); Brink Lindsey & Steven M Teles, *The Captured Economy: How the Powerful Enrich Themselves, Slow Down Growth, and Increase Inequality* (Oxford: Oxford University Press, 2017).

the legal system—for example, due to new technological, social, scientific, or moral realities—that the envisioned system cannot or should not bridge without the public’s explicitly requested input. It also acknowledges that established yet questionable or suboptimal social or legal norms and principles should be revisited—for example, by enacting new laws and abolishing others, rethinking constitutional principles, or overturning judicial decisions. Figure 2 illustrates this interplay between data, technology, and decentralization and how they feed into one another: technology decentralizes the law, leading to valuable feedback in the form of data, which enhances human use of technology.

Figure 2. Data, Technology, and Decentralization



Initiatives along these lines are already emerging, with the understanding that new tools can extend decision-making and consultation to incorporate models of responses from affected groups and the public more generally. CrowdLaw is one expression of the idea that the law should elicit the public’s input and perspectives more often.<sup>95</sup> Another (more recent) case in point is an open-source platform experiment designed to define hate speech. These two examples, which we discuss in turn, demonstrate how technology can democratize legal processes while facilitating participation and inclusivity.

**CrowdLaw.**<sup>96</sup> CrowdLaw seeks to bring the mass input of the public into the halls of legislatures through the internet. Like LexOptima, CrowdLaw envisions a shift from top-down decision-making to more inclusive and collaborative governance, drawing from the broader community. Specifically, CrowdLaw seeks to bring individual citizens closer to the law-creation process through digital participation mechanisms.

To this end, CrowdLaw imagines a future where the public’s experiences and insights play a pivotal role in shaping legislation, from forums like WikiLegis (a project of Wikipedia-esque legislation development websites) to Podemos, perhaps the world’s first political party modelled on the collaborative digital communities found on Reddit. Podemos has successfully used its own digital platforms, like Plaza Podemos and Iniciativas Ciudadanas, to galvanize citizens into crafting policies and shaping its direction. The results have been substantial, with up to 20,000 followers engaging daily in Plaza Podemos discussions.

Even though CrowdLaw and LexOptima share the overarching goal of fostering more participatory governance, their operational boundaries diverge. Deploying a ‘bypass’ strategy, CrowdLaw operates alongside existing institutional frameworks, aiming to amplify citizen participation while preserving the legitimacy of traditional decision-making bodies.<sup>97</sup> While

<sup>95</sup> See “Crowd Law”, online: <<http://crowd.law>>.

<sup>96</sup> Ibid.

<sup>97</sup> Victòria Alsina & José Luis Martí, “The Birth of the CrowdLaw Movement: Tech-Based Citizen Participation, Legitimacy and the Quality of Lawmaking” (2018) 40:2 *Analyse & Kritik* 337.

these initiatives can yield tangible engagement, they stop short of advocating for further redistribution of decision-making power to local entities. As such, the difference between the AI-enabled system we portray and CrowdLaw may have much to do with the extent of their disruptive potential.

**Hate Speech.**<sup>98</sup> The proposed AI-enabled system would seek to decentralize the law by employing technology to endorse sources of law outside the state and multiple legal orders in conversation, both *ex ante* (law creation) and *ex post* (implementation and enforcement). Generally, advocates of decentralization have suggested we ‘do law’ in two recurring and often overlapping ways: Either bringing state law rapidly into contact with more people (think microdirectives) or bringing more people meaningfully into contact with the law (everything from digitized surveys to direct democracy). Our proposal, however, calls for a diffuse and unobtrusive dialogue between the state-based legal order and the individual. As noted, we advocate for a stronger and more frequent reflection of social conventions and attitudes in part by proactively eliciting public input.

In a way, the proposed system strives to employ technology to facilitate multiple so-called “super juries” to improve the law. Let us use a concrete example from the domain of social media platforms to illustrate. In this context, social media platforms use AI systems known as content classifiers to examine user-generated content. Among other things, these systems search for ‘harmful content’ that should be removed, inspected, or otherwise scrutinized or treated differently—a practice termed ‘content moderation.’ Like other AI tools, these content classifiers learn how to identify harmful content by learning from given examples (of various types).

One of the types of harmful content is hate speech. In simplistic terms, one needs to achieve an equilibrium that considers free speech on the one hand and creates a safe environment that prevents harm on the other. But who decides what amounts to hate speech? How do social media platforms define this term and draw the line? The way the AI classifier learns to strike this balance is determined by the training examples it is given. This training, however, is mostly a black box from the public’s point of view.<sup>99</sup> Social media companies, which regularly exercise moderation powers and are permitted (if not required) to do so by law, train their content classifiers behind closed doors with little to no public scrutiny. This is of particular concern given the power of social media platforms, the relevant values (free speech, harm prevention) involved, the large number of users subject to their decisions, and the minimal public and regulatory oversight over the practices of these companies concerning content moderation.

An interesting suggestion in this context is that the public—not a black box algorithm—should determine what constitutes hate speech.<sup>100</sup> To that end, an open-source initiative can illuminate what the public views as hate speech. To inform this process, respondents could include input from—if not be skewed towards—those targeted by hate speech; i.e., those who experienced the harm it inflicts. According to this reasoning, communities most frequently

<sup>98</sup> Much of the discussion that follows draws on: “Crowdsourcing the Curation of the Training Set for Harmful Content Classifiers Used in Social Media: A Pilot Study on Political Hate Speech in India” (October 2023, on file with the authors).

<sup>99</sup> See for example, Warren J von Eschenbach, “Transparency and the Black Box Problem: Why We Do Not Trust AI” (2021) 34 *Philosophy & Technology* 1607; Ninareh Mehrabi et al, “A Survey on Bias and Fairness in Machine Learning” (2021) 54:6 *ACM Computing Surveys* 1; Gideon Christian, “AI Facial Recognition Technology: The Black Box Hurting Black People”, *Toronto Star* (22 August 2023) online: [Toronto Star](http://www.thestar.com) <<http://www.thestar.com>>.

<sup>100</sup> For a somewhat related illuminating discussion see Kenneth W Simons, “Defamatory in Whose Eyes?” (2024) *J Free Speech L* (forthcoming).

targeted with hateful online content should have an active and important role—though not a monopoly—in defining what constitutes hate speech.<sup>101</sup> This, in turn, may facilitate local governance of harmful content, allowing different communities in different jurisdictions to partake and create more granular and context-sensitive definitions of hate speech.

Bringing the construction of training sets for harmful content classifiers into the public domain has merit. It brings a societal issue back to society and exempts decision-makers and adjudicators—social media platforms, judges, regulators, or arbitrators—from speculating how a reasonable person or a given community would perceive harmful speech. It increases public participation, bringing more individuals and communities in touch with the law or the applicable rules. It also encourages empowerment and inclusiveness and enhances transparency. Furthermore, it creates a concrete objective for the consultation process and can bring standardization, where appropriate, across the different companies that engage in context moderation.

Hate speech is just one illustrative example. The idea of using public input to shape legal norms, however, is scalable to numerous domains and contexts, *ex ante* (law creation) and *ex post* (enforcement, monitoring, and interpretation). Significantly, the public's preferences and input can eliminate much of the guesswork around vague legal standards in numerous legal spheres. Thus, it could inform what the 'average consumer' thinks; what would be a 'bad faith' behaviour in contract law, insurance law or trademark law; who deviates from a 'reasonable standard of care' in tort law; when an invention is 'useful' or 'non-obvious' for patent law; when contractual terms shock the conscience and should be deemed unconscionable; under what circumstances an employer undertakes 'reasonable' measures to ensure a safe working environment; what society views as 'the best interest' of a child in custody disputes; what information is 'material' and needs to be disclosed by sellers; how 'public policy' can help in preventing harms from excessive risk-taking or lack of oversight in company law, and much more. Although decision-makers may occasionally have valid reasons to deviate from the resulting public (however defined) perceptions, we accord much value to this mix of technology, public participation, and data.

#### IV. *An Operational Spectrum*

"The problem with law is lawyers."<sup>102</sup>

- Clarence Darrow

Having explored the vast potential of data and the guiding principles of LexOptima, we next focus on its operational dimension. To oversimplify, the envisaged system could operate in a more modest operational mode, termed 'facilitating,' to a more ambitious counterpart mode, referred to as 'transformative.' In its facilitating mode, the system would operate relatively incrementally, focusing on enhancing and refining existing legal processes and mechanisms, rather than instigating a complete overhaul. In its ambitious-transformative mode, however, the system would suggest deep conceptual shifts that could profoundly revolutionize legal principles, rules, and approaches. It could create novel alternatives to current systems or

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<sup>101</sup> Public annotators and survey respondents would still be rating based on objective guidelines for levels of harm, not just personal offense, and disagreement across raters could help balance biases and inform the decision-making process. Other measures, like using multiple annotators, continuous measurement, and classifier confidence, could all help mitigate risks that any one group will skew results significantly. Alternative approaches, like recruiting groups generally affected by types of harm (rather than specifically targeted communities) and having a generally representative sample, could also minimize the risk of biased results.

<sup>102</sup> Simon R James & Chantal Stebbings, eds, *A Dictionary of Legal Quotations* (Routledge, 1987) 103 (quoting Clarence Darrow).

practices in ways that may challenge traditional legal thought and well-established norms or assumptions.

While we deploy a terminology that differentiates between the ‘facilitating’ and ‘transforming’ modes of operation, it is important to note there would be no true bright line boundary distinguishing enhancement from transformation. As enhancements intensify and gain significance, they move progressively towards transformation. An AI-enabled legal system will often combine the two modes of operation, aspiring to synthesize a mass of laws and perspectives via algorithms to generate situationally quasi-optimal legal rules. This fluidity suggests that these operational modes of enhancement and transformation are not binary but simply vary by intensity and degree.

#### A. The Facilitating Mode

In its facilitating mode, the system would leverage data and technology to streamline the flow of legal information and broaden access to justice. Here, it would pursue discrete bypasses around clogged institutions and procedures.<sup>103</sup> While doing so, it will preserve institutional capabilities where necessary (for trust, safety, quality control, etc.), localize and hybridize institutions and their functions, and adapt and repurpose old hierarchies and structures. This facilitating vector is in its early days and may currently refer to many legal self-services and prediction technologies.<sup>104</sup>

At the most basic ‘facilitating’ level, technologies can accelerate access to justice through the digital transformation of forms. Consider traditional paper-based legal processes: They have long been a barrier to justice for many, particularly those who lack the requisite literacy skills or face physical or logistical challenges in accessing legal services. In the United States, for instance, many courts have introduced online platforms for filing cases and submitting legal documents. In California, the TurboCourt system allows individuals to complete and file forms online for various legal matters such as small claims, family law, and landlord-tenant disputes.<sup>105</sup> Similarly, in the United Kingdom, the Money Claim Online (MCOL) system enables people to make or respond to a claim online, bypassing the need for physical paperwork.<sup>106</sup>

The proposed model would move legal systems further than these initiatives and facilitate what we call ‘smart digitization.’ Smart digitization entails considerably more than simple digitization. Examples may include ensuring legal forms are user-friendly and easy to navigate, providing interactive explanatory notes, employing visuals, using plain and personalized language that fits the user’s characteristics, and proactively assisting the user in filling out the form. There are first moves in this direction, in which interactive online platforms ease access to legal information by employing AI bots. These bots can provide information, answer questions, identify legal issues, and evaluate litigation outcomes.

Consider, for example, JusticeBot, a methodology for building augmented intelligence

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<sup>103</sup> We are inspired here by the work of Mariana Mota Prado and Michael Trebilcock. See Mariana Mota Prado and Michael J. Trebilcock, *Institutional Bypasses: A Strategy to Promote Reforms for Development* (Cambridge University Press, 2018).

<sup>104</sup> Examples may include platforms and tools that predict the outcomes of legal conflicts, estimate damages, interpret legal documents, assist laypeople in filling legal forms, help weak parties to become familiar with their rights and obligations, or ‘translate’ complex legal text into everyday language. We return to some of these examples in more detail below.

<sup>105</sup> See “TurboCourt”, online: <<http://turbocourt.com>>.

<sup>106</sup> See “Money Claim Online”, online: <<http://www.moneyclaim.gov.uk>>.

tools that aim to increase access to justice for laypeople.<sup>107</sup> These tools provide legal decision support to individuals without legal training, helping them explore their legal rights in specific situations. One central attribute of JusticeBot is a hybrid case-based and rule-based reasoning: Asking users questions about their circumstances and providing them with legal information, references to previous similar cases, and possible next steps.

Another feature is highlighting applied legal rules from legislation and case law. Among other things, JusticeBot encodes previous cases to provide users with relevant information and offer guidance based on past legal outcomes. This capability illuminates an interesting analogy between AI tools and common law judges: Both are trained on data to extract the relevant (or binding) principles and apply them to new settings. Consistent with this analogy, a notable application of the JusticeBot methodology is its deployment in landlord-tenant conflicts. Thousands of tenants have used the JusticeBot version to better understand their rights and obligations and take appropriate actions to resolve their disputes.

Along somewhat similar lines, JustFix is a nonprofit organization that provides technological tools to assist tenants in resolving housing issues and “exercise their rights to a livable home.”<sup>108</sup> This platform offers resources and guidance for tenants facing problems such as repairs, harassment, and eviction. JustFix provides features like document generation, communication tools, and access to legal information to empower tenants and increase their access to justice – potentially bypassing the need for costly legal advice.

As a final illustration, DoNotPay offers a comprehensive one-stop solution for legal self-help, aiming to minimize the time and financial burdens typically associated with legal proceedings for ordinary individuals.<sup>109</sup> In simple terms, DoNotPay is a legal technology platform powered by AI that provides automated legal aid to users. It proposes a gamut of services addressing common legal issues, from disputing parking tickets and cancelling subscriptions to assisting with small claims cases.

DoNotPay employs chatbots and algorithms to navigate users through legal procedures, equipping them with pertinent information and resources. The underlying goal of the platform is to democratize legal assistance, making it more accessible and affordable, particularly for those who may lack the means to engage a professional lawyer. Despite criticism concerning its reliability from users and legal professionals alike, the burgeoning demand for such services underscores the potential of new technologies to aid laypeople with the complexities and intricacies of the current legal system.

Importantly, the ‘facilitating’ mode extends beyond individual or business users to encompass the broader legal ecosystem, including courts, legislatures, and regulators. By leveraging data and technology, we can significantly enhance institutions’ efficiency, transparency, and responsiveness, fostering a more dynamic and effective legal system. These institutions could use data and information flows—core elements of an AI-enabled legal system—as a powerful tool to identify trends, flag issues, and uncover areas that might require further deliberation, scrutiny, or regulation. By monitoring data and information flows, the system can proactively address potential legal issues before they escalate, thereby preempting legal conflicts and streamlining the dispute resolution process.

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<sup>107</sup> Hannes Westermann & Karim Benyekhlef, “JusticeBot: A Methodology for Building Augmented Intelligence Tools for Laypeople to Increase Access to Justice” in *Proceedings of the Nineteenth International Conference on Artificial Intelligence and Law, Braga, Portugal, 2023* (New York: Association for Computing Machinery, 2023) 351.

<sup>108</sup> See “JustFix”, online: <<http://www.justfix.org>>.

<sup>109</sup> See “DoNotPay”, online: <<http://donotpay.com>>.

Take, for example, the realm of consumer protection. In the face of rapidly evolving technology and business practices, regulators often struggle to keep pace and adequately protect consumers. However, with the aid of and AI-enabled legal system, lawmakers and regulators can analyze data from consumer complaints, business reports, and market trends to identify areas of concern. This could range from identifying a surge in complaints about a particular business practice to detecting emerging market trends that could harm consumers if left unregulated. The discussion above regarding dark patterns demonstrates this point.

The advent of this trend is already perceptible. For instance, Yadin discusses how regulators increasingly leverage technology platforms, including websites, social media, and mobile applications, to collect and disseminate data regarding corporate behaviour and compliance.<sup>110</sup> Yadin cites many instances where regulators, such as the CFPB, CPSC, and FDA, use complaint databases, publish data on violations to inform consumers, and exert reputational pressure on corporations. Additionally, Yadin explores how technology facilitates real-time dissemination of warnings and information to the public via platforms like Twitter. Yadin further underscores how emerging technologies enable regulators to present data in a more visual, interactive, and user-friendly manner, favouring the use of maps, tables, and infographics over text-heavy reports. Machine learning techniques can reinforce this approach, as such techniques can reveal patterns and trends within regulatory data that might not be immediately discernible to human analysts, thereby augmenting enforcement regimes.

Similarly, legislatures could use data to monitor the effectiveness of existing laws and identify areas where new legislation might be needed. For instance, data on crime rates and conviction rates could help legislatures identify areas of the criminal justice system that need reform. Likewise, data on social issues such as income inequality or housing affordability could inform the development of new legislation in these areas. As the discussion above regarding CrowdLaw indicates, legislators could also employ technologies to more effectively elicit the public's views and preferences. As a positive side-effect, this also promises to curtail regulatory capture, vested interests, and lobbying.

Courts too could derive significant advantages from the 'facilitating' mode of the proposed system. For instance, experts could employ data analysis to streamline court operations and mitigate case backlogs. Courts can identify and rectify procedural bottlenecks by scrutinizing data pertinent to case types, durations, and outcomes. As emphasized throughout, courts can harness data to enhance decision-making processes. At its most basic, judges could utilize data from past cases to inform their rulings in similar future cases. On a more advanced level, as previously discussed, courts could leverage data and information flows to refine the definition and application of legal standards, aligning them more closely with public perspectives and social realities.

In conclusion, the 'facilitating' mode has the potential to significantly affect how individuals and businesses interact with the legal system. It can also impact the operation of courts, legislatures, and regulators. By leveraging data and technology, these institutions can become more efficient, proactive, and responsive, thereby advancing inclusivity and democratization. But while impressive in and of itself, an AI-enabled system can do much more than that.

## B. The Transformative Mode

Flawed operational models and inadequate systems of governance are not typically solved simply by introducing new technology. Moving beyond the facilitating mode, we now turn to

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<sup>110</sup> Sharon Yadin, "E-Regulation" (2020) 38 Cardozo Arts & Ent LJ 101.

the transformative and innovative mode, which proves more challenging to imagine or forecast due to its groundbreaking nature. Generally speaking, the transformative mode could pave the way for creating an open-source legal framework, conceptually free from the constraints of existing borders and boundaries. This framework could be perpetually scrutinized and enhanced through the employment of evolving, collaboratively developed, potentially self-iterating and self-improving algorithms and protocols. The elements of this approach to law could be modular, designed to be interchangeable and upgradable, all while safeguarding the overall unity and efficiency of the system. The more visionary versions of CrowdLaw and personalized law provide a glimpse into what this innovative direction might entail.<sup>111</sup>

Should it emerge, the transformative mode will disrupt the traditional division of labour between humans and machines. In the current landscape, technological advancements enable robots to perform a wide array of tasks alongside their human counterparts, often enhancing productivity and overall work performance. However, as these technologies become more sophisticated, human involvement could hinder efficiency, undermine output quality, and delay advancement. To fully harness the potential of these new technologies, we may need to reconsider and gradually reduce human decision-making power in many domains.

The challenge then becomes the continuous identification and reassessment of areas where human input remains superior or necessary; for example, for boosting legitimacy, user well-being, and trust. In terms of legitimacy, the legal system must not only be fair but also be perceived as such by the people it governs. Human judges, legislators, and regulators play a crucial role in maintaining this perception of fairness and legitimacy. They bring a level of empathy, understanding, and context-awareness that technology has yet to emulate fully.<sup>112</sup>

Similarly, the legal system often deals with sensitive issues that can significantly impact an individual's well-being. Human input is critical: Humans can provide emotional support, understand complex human feelings, and make judgments that consider the psychological impact on those involved. This human element is especially important in areas like family law or criminal rehabilitation, where resolutions must be not only legally sound but also considerate of the human condition. More generally, people often find it important and emotionally comforting to voice their perspectives and grievances before a human authority, further underlining the importance of human interaction.<sup>113</sup>

Trust in the system is also crucial for any legal process. While AI can provide consistency and impartiality, the human elements—empathy, understanding, and the ability to relate personally—inculcate and support trust.<sup>114</sup> Users need to feel that their unique circumstances and experiences are understood and considered in the decision-making process. For now, this level of trust is more readily established through human interaction, as people can feel frustrated with and alienated by automated responses or decisions.<sup>115</sup>

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<sup>111</sup> There are, of course, other ambitious visions that are potentially compatible with the kind of approach we are describing, including the work by Gillian Hadfield. See Gillian Hadfield, *Rules for a Flat World* (Oxford University Press, 2016).

<sup>112</sup> Sherry Turkle, *Reclaiming Conversation: The Power of Talk in a Digital Age* (New York: Penguin Books, 2015).

<sup>113</sup> See the classic work by E Allan Lind & Tom R Tyler, *The Social Psychology of Procedural Justice* (New York: Springer, 1988).

<sup>114</sup> For a general discussion see Robert C Solomon & Fernando Flores, *Building Trust in Business, Politics, Relationships, and Life* (Oxford: Oxford University Press, 2001).

<sup>115</sup> For a mundane recent illustration see Van Badham, "Supermarkets are Ditching Self-Checkouts in a Sign That We Can Push Back Against the Technofuturist Tide", *The Guardian* (23 November 2023) online: The

While technology can enhance the efficiency and accuracy of many legal processes, continuously identifying and reassessing areas requiring the human touch remains essential.<sup>116</sup> Balancing AI's capabilities with humans' unique contributions will be a key challenge as we evolve towards a more data-driven, personalized, and automated legal system. In its early stages, we could use a hybrid approach combining AI's and human decision-making strengths. AI could handle routine, technical, repetitive, contained, or straightforward issues, leaving more complex, creative, novel, open-ended, or sensitive cases to humans. For example, initial implementation could include small claims disputes or instances where the disputing parties agree to use the automated system to arbitrate their cases. While there is still a need to question, elaborate upon, and constantly revisit the exact dividing lines, the hybrid approach would free up much-needed time for legal professionals to focus on cases that require a deeper understanding of context, empathy, and human intuition.<sup>117</sup>

Current AI systems mostly operate as "black boxes," meaning humans do not easily understand their decision-making processes.<sup>118</sup> As noted above, an AI-enabled legal system would include more transparent AI systems that could explain their reasoning in a way humans can understand. This transparency could then feed into mechanisms for accountability, and provide a safeguard against potential misuse or biases in AI systems. Unlike most current AI systems developed by commercial firms, the public nature of the legal system will likely enhance such a shift towards transparency and explainability.

Gradually, advances in AI technology could lead to systems that can better understand and simulate human emotions and grasp complex social and cultural contexts. This would make AI decisions more nuanced and sensitive to the human condition, supplementing the role of human professionals and augmenting their contribution. Simultaneously, legal professionals will need to be trained in using AI tools and data-driven decision-making. This would equip them to work effectively alongside AI, understand the strengths and limitations of these systems, and intervene when necessary. This mix of AI and human input will require continuous reassessment and adjustment as technology progresses and our understanding of its potential and pitfalls deepen.<sup>119</sup>

Ultimately, however, the overall trend will lean towards reducing the roles of humans in the day-to-day workings of the legal system. LexOptima will not only encourage but also streamline the delegation of legal decision-making to technologies (referred to as 'justice bots') or to the public (via online platforms). In a reality where technological tools either automate or preempt adjudication, we ought to fundamentally reassess the judiciary's role and its core function of dispute resolution and legal development. Likewise, 'legislative bots' or smart public engagement could assume much of the legislatures' traditional roles.<sup>120</sup> The emergence of AI-generated personalized laws could render current legislative practices obsolete, and

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Guardian <<http://www.theguardian.com>>. For questioning the ability of machines to replace human decision-making in legal contexts see Daniel J. Solove & Hideyuki Matsui, "AI, Algorithms, and Awful Humans" (2024) 96 Fordham LR (forthcoming) (arguing that decisions about humans involve emotional and moral considerations that machines are incapable of making).

<sup>116</sup> Martinez & Meztis, *supra* note 56.

<sup>117</sup> We acknowledge that moving from the 'facilitating' mode to the 'transforming' one in this context is not trivial. It is possible, for instance, that judges would use AI tools to write more opinions that are more readable, persuasive, and entertaining rather than focusing on the best outcomes and rules for the most complex cases. For discussing the future of judicial opinions see Richard M Re, "Artificial Authorship and Judicial Opinions" (2024) George Washington LR (forthcoming).

<sup>118</sup> von Eschenbach, *supra* note 99.

<sup>119</sup> Nantiya Ruan, "Attorney Competence in the Algorithm Age" (2021) 35 ABA J Lab & Employment L 317.

<sup>120</sup> Richard Susskind, "I Asked ChatGPT to Write Some Laws – This is What Happened", *The Times* (4 April 2024) online: *The Times* <<http://www.thetimes.co.uk>>.

require new swathes of regulation. This could prompt a need to redefine legislators' roles and contemplate the implications of such developments for our legal institutions. Similarly, delegating administrative decision-making, monitoring, and enforcement tasks to technologies ("administrative bots") or to the public (via online platforms) will require a deep re-evaluation of the roles and functions of administrators.

The transformative mode also underscores the important realization that just because we *can* 'enable' something, it does not necessarily mean we *should*. If the legal system embraces the wrong approach, improving it may amplify its flaws and missteps.<sup>121</sup> Enablement is beneficial only when the result and the overall outcome are deemed desirable. There is little merit in fortifying processes or practices that lead to undesirable or suboptimal outcomes. In essence, the ability to improve or enhance a particular approach should not discourage us from the ongoing pursuit of the best possible solutions.

Consider the realm of criminal trials and punishment as a theoretical illustration. Let's assume that automating legal disputes slashes the duration of a criminal trial from 10 months to 10 minutes. At first glance, this seems like a tremendous leap in efficiency and a successful eradication of system delays. However, in its transformative form, the system could potentially propose a more radical idea: Eliminating trials altogether. Drawing upon various legal traditions and diverse data sources—e.g., philosophy, psychology, neuroscience, natural experiments, criminology, and recidivism statistics—LexOptima may encourage us to challenge the very foundations of our criminal law system. Given its AI capabilities, it could powerfully aggregate and connect different findings and insights to convincingly establish that our basic assumptions about free will and choice are flawed,<sup>122</sup> or that our understanding of distributive justice is misguided.<sup>123</sup> Whereas we are not obliged to accept any of its proposals or theories, this capability opens an unprecedented opportunity for exploring numerous and potentially immensely valuable paths for legal reform.

There are many other profound ways we could use data and knowledge to revolutionize the legal system. As detailed above, the transformative potential of an AI-enabled legal system could manifest in personalized legislation, making legislation highly individualized, much like personalized medicine. Laws could be tailored to an individual's circumstances, behaviour, and needs. For instance, tax laws could be adapted based on a taxpayer's unique financial situation and societal contributions, leading to a more equitable and efficient system of public finance.

Another profound transformation might take shape through predictive justice. Leveraging machine learning technologies, the envisioned system could predict the outcomes of legal disputes, helping to prevent potential conflicts and wasteful litigation before they escalate.<sup>124</sup> By analyzing historical case data, legal AI tools could provide insights into how a judge might rule on a particular case. This predictive capability could even extend to anticipating the potential for criminal recidivism, informing preventative measures, and contributing to a more proactive justice system.<sup>125</sup>

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<sup>121</sup> See the discussion in Aidid and Alarie, *supra* note 15.

<sup>122</sup> For one such voice see Robert Sapolsky, *Determined: A Science of Life Without Free Will* (New York: Penguin Books, 2023).

<sup>123</sup> For one perspective see Shirin Bakhshay, "The Dissociative Theory of Punishment" (2023) 111:6 Geo LJ 1251.

<sup>124</sup> See, for example, Benjamin Alarie, Anthony Niblett & Albert Yoon, "Using Machine Learning to Predict Outcomes in Tax Law" (2016) 58(3) Canadian Business Law Journal.; also "Blue J", online: <<http://www.bluej.com>>;

<sup>125</sup> For a general discussion framing AI capabilities around prediction see Ajay Agrawal, Joshua Gans & Avi

As a final example of the transformative mode, consider a new era of automated real-time regulation. With the help of IoT devices and real-time data, a system of automated regulation could respond to events as they occur. This advance could be particularly impactful in a field like environmental law, where real-time data on pollution levels could trigger immediate regulatory responses. Take, for instance, a scenario involving industrial pollutants. Factories could be equipped with IoT sensors that monitor and report emissions in real time. These sensors could be programmed to detect certain pollutants that exceed acceptable levels. When increased levels of a specific pollutant are detected, the system could automatically notify regulating authorities and the factory management. Simultaneously, the system could trigger immediate corrective actions, such as adjusting the functioning of pollution control equipment or even halting factory operations until the issue is resolved.

This represents a shift from the traditional model of regulation, which tends to be reactive and often relies on infrequent inspections or reporting by the companies themselves. Such proactive regulation could ensure more effective protection of the environment and rapid response to potential ecological crises. Automated regulation, powered by AI and IoT technologies, could dramatically advance environmental law enforcement and better safeguard our planet.

In conclusion, the proposed model—empowered by technological advancements and data analytics—holds enormous potential to revolutionize the legal system. The transformation could span from streamlining legal disputes to fundamentally re-imagining our criminal law system. This new vision invites us to consider personalized legislation that tailors laws to individual circumstances, predictive justice that anticipates legal outcomes, and automated real-time regulation that responds to events as they unfold. More profoundly, it compels us to reassess the roles of judges, legislators, and regulators, and to contemplate the implications of this transformation for core values and principles such as justice, punishment, and the rule of law.

## V. Navigating Challenges

“Life keeps throwing me stones.  
And I keep finding the  
diamonds.”<sup>126</sup>

– Ana Claudia Antunes

Like other technological developments, the advent of an AI-enabled legal system will raise numerous legal and operational challenges. Below, we concisely address a suite of emerging issues, employing a typology of three types of challenges: (1) technological, (2) substantive, and (3) human-related. Technological challenges pertain to the limitations and potential risks of AI and digital technologies. Substantive challenges refer to the broader implications for user agency, distributive justice, and societal biases. Lastly, human-related challenges signify the practical issues related to acceptance, adoption, and adaptation to new technologies among legal professionals and society at large. Whereas this part discusses these challenges, it is important to recognize that the brief treatment here merely hints at the profound complexities inherent in each of these multifaceted challenges, which merit extensive examination with which we engage elsewhere.<sup>127</sup>

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Goldfarb, *Power and Prediction: The Disruptive Economics of Artificial Intelligence* (Brighton, MA: Harvard Business Press, 2022).

<sup>126</sup> Ana Claudia Antunes, *A-Z of Happiness: Tips for Living and Breaking Through the Chain that Separates You from Getting That Dream Job* (Lulu.com, 2015).

<sup>127</sup> Alarie & Becher, *supra* note 22.

## A. Technological Challenges

The initial set of challenges that the proposed legal system will grapple with are technological in nature. These are tied to the present limitations of AI and other digital technologies. Despite considerable progress, AI today sometimes struggles with understanding context and making nuanced judgments that consider the intricate realities of human life.<sup>128</sup> As noted, new technologies also often function as “black boxes,” with processes that are obscure and hard for humans to comprehend.<sup>129</sup>

Additionally, LLMs can sometimes generate disturbing, incorrect, or inaccurate outputs—a phenomenon generally known as hallucination.<sup>130</sup> This relates to a more general challenge known as the misalignment problem, which refers to the difficulty of ensuring AI systems remain fully aligned with ethical human values.<sup>131</sup> AI systems optimize the goals they are programmed to pursue, which may not fully capture complex human values like fairness, compassion, and empathy. AI systems become more capable and autonomous over time through recursive self-improvement. Hence, such systems may find unintended or unanticipated ways to meet specified goals that humans did not intend and would see as immoral or dishonourable.

However, it is crucial to acknowledge that these technological hurdles are not inevitable and are unlikely to be perpetually enduring. AI is advancing briskly, driven by continuous enhancements in machine learning algorithms, data processing capabilities, system design, and training techniques.<sup>132</sup> Simultaneously, advances in related fields like data science, cloud computing, and quantum computing are poised to bolster and expedite the evolution of AI.

This optimism about overcoming AI’s current technical limitations is not unfounded or misguided. Artificial intelligence development receives substantial investments worldwide, drawing top talent and sizable capital from the public and private sectors. This concentration of money and brainpower accelerates scientific progress in the field. Furthermore, the open nature of much of AI-related research itself—where findings are publicly shared—also contributes to rapid advancement. Moreover, AI is becoming more widespread, leading to a greater variety of applications. This diversity promotes innovation and accelerates the discovery of new and better techniques and approaches. More specifically, there is an increasing focus on improving AI’s transparency and interpretability, aimed at opening the “black box” and making AI decisions more understandable to humans.<sup>133</sup> Efforts are also underway to study and reduce AI “hallucinations” through better data quality and innovative training techniques.<sup>134</sup>

History has shown that technological advancements often follow an exponential rather

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<sup>128</sup> See generally Emily M Bender et al, “On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?” in *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency, Online, 2021* (New York: Association for Computing Machinery, 2021) 610.

<sup>129</sup> Andrew D Selbst et al, “Fairness and Abstraction in Sociotechnical Systems” in *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency, Online, 2021* (New York: Association for Computing Machinery, 2021) 59.

<sup>130</sup> See Ziwei Ji et al, “Survey of Hallucination in Natural Language Generation” (2023) 55:12 ACM Computing Surveys 1.

<sup>131</sup> See for example, Iason Gabriel “Artificial Intelligence, Values, and Alignment” (2020) 30:3 Minds & Machines 411.

<sup>132</sup> Bill Gates, “The Age of AI Has Begun” (21 March 2023), online: GatesNotes <<http://www.gatesnotes.com>>.

<sup>133</sup> von Eschenbach, *supra* note 99.

<sup>134</sup> See for example, Charlie George & Andreas Stuhlmüller “Factored Verification: Detecting and Reducing Hallucination in Summaries of Academic Papers” (2023), online: arXiv preprint <<http://arxiv.org>>.

than linear trajectory. A classic example of exponential progress in technology is Moore's Law.<sup>135</sup> In essence, Moore's Law predicts that the overall processing power for computers will double every two years. Despite being over half a century old, this law has largely held true, which is why we have seen such dramatic improvements in computational capabilities over the last few decades. From the room-sized computers of the 1960s, we have moved to handheld devices with far more processing power. This progress has enabled the development of numerous technologies we now take for granted, such as smartphones, cloud computing, and the machine learning algorithms that underpin modern AI and will propel LexOptima.<sup>136</sup>

Considering the course of advancements thus far, it is reasonable to anticipate substantial enhancements in AI capabilities as time progresses. As we move forward, many existing AI limitations will likely be overcome. Despite the considerable and tangible challenges that persist, the general optimism regarding the future of AI is well-founded. The key question will therefore be not whether technology is *capable* of doing something, but rather *whether* it should do and *how* we design our system to optimally benefit from it.

### B. Substantive Challenges

The second type of challenge an AI-enabled system must address is substantive. As the previous discussion reveals, these challenges encompass a broad and tricky array of issues. Among these issues are bias, user agency and autonomy, distributive justice, and the digital divide. For instance, data can only be obtained from technology users, which may disadvantage or underrepresent older generations and non-tech-savvy groups.<sup>137</sup> More generally, integrating AI into legal systems could undermine fairness, transparency, and accountability.<sup>138</sup> The use of AI could also lead to hard-to-contest outcomes, undermining individuals' right to challenge legal decisions and hold decision-makers responsible.<sup>139</sup> Indeed, incorporating AI into our legal systems brings profound questions about the foundational principles of law.<sup>140</sup>

To confront these challenges, we must pursue strategic approaches that uphold key principles even as we integrate these new technologies. One such approach is the development of explainable AI. While not a magic bullet, explainability aims to create AI systems that provide transparent rationales for their decisions.<sup>141</sup> This can aid in preserving the principle of contestability in legal decisions. Additionally, fairness must be a cornerstone in AI design and implementation. This necessitates diverse and representative data in training AI systems, alongside regular auditing for bias and fairness and constant public input. Likewise, maintaining human control and supervision in the decision-making loop can help preserve accountability. Regulatory frameworks should be established to provide oversight, setting

<sup>135</sup> Robert R Schaller, "Moore's Law: Past, Present and Future" (1997) 34:6 IEEE Spectrum 52.

<sup>136</sup> However, the energy required to power generative AI, estimated to already be as much as that of a small country, is also a significant general consideration to bear in mind. Brian Calvert, "AI Already Uses as Much Energy as a Small Country. It's Only the Beginning" (28 March 2024), online: Vox <<http://www.vox.com>>.

<sup>137</sup> See also Christoph Lutz, "Digital Inequalities in the Age of Artificial Intelligence and Big Data" (2019) 1:2 Human Behavior & Emerging Technologies 141; Ismail Celik, "Exploring the Determinants of Artificial Intelligence (AI) Literacy: Digital Divide, Computational Thinking, Cognitive Absorption" (2023) 83 Telematics & Informatics 102026.

<sup>138</sup> Stanley Greenstein, "Preserving the Rule of Law in the Era of Artificial Intelligence (AI)" (2022) 30 AI & L 291.

<sup>139</sup> Maxi Scherer, "Artificial Intelligence and Legal Decision-Making: The Wide Open?" (2019) 36:5 J Intl Arb 539; Tania Sourdin, "Judge v Robot? Artificial Intelligence and Judicial Decision-Making" (2018) 41 UNSWLJ 1114.

<sup>140</sup> Joshua P Davis, "Law Without Mind: AI, Ethics, and Jurisprudence" (2018) 55:1 Cal WL Rev 165.

<sup>141</sup> Alejandro Barredo Arrieta et al, "Explainable Artificial Intelligence (XAI): Concepts, Taxonomies, Opportunities and Challenges Toward Responsible AI" (2020) 58 Information Fusion 82.

transparency and accountability standards.<sup>142</sup> Here, too, the public should be involved in discussions about AI's role in the legal system, helping ensure alignment with societal values.

Bias poses another thorny challenge. AI systems are trained on data that reflects existing biases in society.<sup>143</sup> As a result, they can unintentionally perpetuate and even amplify these biases.<sup>144</sup> Furthermore, using AI to build new legal systems could potentially result in a monolithic legal culture, where diverse perspectives and nuances are not adequately considered, and predominant yet biased legal traditions become even more dominant.<sup>145</sup> This lack of inclusiveness, the argument goes, could disadvantage certain groups within society and undermine the fairness of the legal system.

In response to this concern, we underscore the aspiration to integrate multiple legal traditions to inform its analysis. It seeks to seriously consider different jurisdictions, approaches, and legal traditions; for example, by incorporating all available legal data in all languages and societies. As discussed in Part III, this diversity can lead to robust legal systems, as different approaches can offer unique insights and solutions. Moreover, it can ensure that legal systems are more reflective of and responsive to the diverse societies they serve.

In this context, we draw parallels between the preservation of multiple legal perceptions and the existence of various languages, currencies, and even religious beliefs. Each of these examples reflects the diversity and complexity of human society, and each serves unique functions that contribute to the richness and resilience of our global community. Languages, for instance, are more than just communication tools—they embody cultural identities, histories, and ways of thinking.<sup>146</sup> Nations maintain different currencies as a tool for economic policy, allowing them to control local inflation, respond to shocks to demand for certain regionally concentrated products and services, better manage their economies, and foster stable economic growth.<sup>147</sup> Although a more sensitive and possibly contested analogy, the variety of religions can also shed light on the value of preserving multiple legal perceptions. Religions represent a wide range of philosophical and moral perspectives on life, contributing to a diverse ethical landscape.<sup>148</sup> Similarly, diverse legal perceptions can contribute to a rich tapestry of understanding about justice, fairness, and the rule of law.

Also of noteworthy concern are user agency, autonomy, and mastery.<sup>149</sup> AI systems can

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<sup>142</sup> Companies have recently adopted self-regulation measures to ensure safe and responsible AI development, see “Frontier Model Forum”, online: <<http://www.frontiermodelforum.org>>. However, companies have conflicting incentives and additional governmental and non-profit scrutiny is imperative.

<sup>143</sup> Aylin Caliskan, Joanna J Bryson & Arvind Narayanan, “Semantics Derived Automatically from Language Corpora Contain Human-Like Biases” (2017) 356:6334 *Science* 183.

<sup>144</sup> See Victoria Burk, “How AI Reduces the World to Stereotypes” (10 October 2023), online: Rest of World <<http://restofworld.org>>.

<sup>145</sup> Charvi Rastogi et al, “Deciding Fast and Slow: The Role of Cognitive Biases in AI-Assisted Decision-Making” (2022) 6:83 *Proceedings of the ACM on Human-Computer Interaction* 1; Simon Jelley, “Garbage In, Garbage Out: The Role of Data Management in Effective AI”, *Forbes* (16 November 2023) online: Forbes <<http://www.forbes.com>>; “Shedding Light on AI Bias with Real World Examples” (16 October 2023), online: IBM <<http://www.ibm.com>>.

<sup>146</sup> See for example, Claire Kramsch, “Language and Culture” (2014) 27:1 *AILA Review* 30; Leonid Perlovsky, “Language and Emotions: Emotional Sapir-Whorf Hypothesis” (2009) 5 *Neural Networks* 518.

<sup>147</sup> See for example, Robert A. Mundell, “A Theory of Optimum Currency Areas” (1961) 51:4 *Am Econ Rev* 657.

<sup>148</sup> See for example, Ryan McKay & Harvey Whitehouse, “Religion and Morality” (2015) 141:2 *Psychological Bulletin* 447; see also Sumner B Twiss, “Comparison in Religious Ethics” in William Schweiker, ed, *The Blackwell Companion to Religious Ethics* (Malden, Massachusetts: Blackwell Publishing, 2005) 333.

<sup>149</sup> See generally Stefan Larsson, “Algorithmic Governance and the Need for Consumer Empowerment in Data-Driven Markets” (2018) 7:2 *Internet Policy Rev* 1.

make decisions quickly and efficiently. But in the process, they could potentially reduce the agency of individuals and legal professionals. They could also create a sense of dependency and undermine users' autonomy as complex legal decisions are increasingly delegated to machines. Furthermore, collaboration with automated systems could lead users to over-rely on the system and not fulfil their supplementing or supervisory roles effectively.<sup>150</sup>

As discussed above, several strategies can be employed to mitigate such concerns. First, we re-emphasize that in the first stages (and in its 'facilitating' mode), AI tools would serve to augment human decision-making, not abruptly replace humans as decision-makers. Second, to prevent over-reliance on AI systems, users will need continuous education and training. This includes understanding the capabilities and limitations of AI systems and the ethical implications of their use. Third, transparency and explainability in AI would also, at least in part, address this problem. If users can understand how the AI makes its recommendations, they are more likely to use the system as a tool rather than a crutch.

In the long run, however, humans will indeed have to find other, additional ways or spheres to enhance their mastery, agency, and autonomy. One of these paths would be to emphasize humans' role in supervising AI systems and making decisions in critical or sensitive domains where AI decision-making would be unacceptable. In regulating those involved with AI development, applying a bottom-up approach to training and certification processes may be imperative in professionalizing the industry and further mitigating biases.<sup>151</sup> Beyond that, AI-driven systems are likely to generate multiple other paths to enhance human autonomy and flourishing that are currently hard to formulate or foresee.

Distributive justice and the digital divide present another set of challenges. The benefits of AI are already not evenly distributed across society. Digital tools may favour those with access to technology and the skills to use it, potentially exacerbating existing social inequalities.<sup>152</sup> We noted above how access to justice is one of the core values of our imagined system. As we move towards a more automated legal system, we must ensure access to justice for all, irrespective of digital skills or access to technology. This major societal challenge moves beyond an AI-enabled legal system and pertains to all digital tools and developments.

### C. The (Vulnerable) Human Factor

The third type of challenge that the envisaged system will face is human-related challenges. These challenges largely stem from human nature and their responses to the integration of AI into legal systems.<sup>153</sup> Resistance to change, especially among lawyers who are often seen as traditional and slow to adapt, can pose a significant hurdle. Established practices and norms have long governed the legal profession, and shifting towards a more technologically-driven approach is apt to be daunting. Concerns about "robot lawyers" and doomsday scenarios can create fear and apprehension among legal professionals and the public alike.<sup>154</sup> These fears can

<sup>150</sup> See Raja Parasuraman & Dietrich H Manzey, "Complacency and Bias in Human Use of Automation: An Attentional Integration" (2010) 52:3 Human Factors 381.

<sup>151</sup> Jacob Turner & Tristan Goodman, "Professionalising the AI Industry: To Control Technology, We Should Regulate Humans" (2024) <<http://papers.ssrn.com>>; Chinmayi Sharma, "AI's Hippocratic Oath" (2024) Wash L Rev (forthcoming).

<sup>152</sup> See for example, Joel Cooper, "The Digital Divide: The Special Case of Gender" (2006) 22:5 J Computer Assisted Learning 320; Krish Chetty et al, "Bridging the Digital Divide: Measuring Digital Literacy" (2018) 12:1 Econs 1.

<sup>153</sup> See Michael Trebilcock, *Dealing with Losers* (Oxford University Press, 2014).

<sup>154</sup> See for example, Max Tegmark, *Life 3.0: Being Human in the Age of Artificial Intelligence* (New York: Vintage Books, 2018); Richard Susskind & Daniel Susskind, *The Future of the Professions: How Technology will Transform the Work of Human Experts* (Oxford: Oxford University Press, 2015); Sherry Turkle, *Alone Together: Why We Expect More from Technology and Less from Each Other* (New York: Basic Books, 2011).

be compounded by sensationalist media coverage and a lack of understanding of the capabilities and limitations of AI.

Technological advancements repeatedly generate winners and losers.<sup>155</sup> In the context of AI integration into legal systems, losers could include legal professionals whose roles become redundant or individuals who lack the digital skills or resources to engage with AI-enabled legal services. There will be a dynamic feedback process through which the legal market will adjust, eliminating some jobs or tasks, changing others, and creating new ones. This adaption process will inescapably bring change, disrupt the current status quo, and, unfortunately, adversely affect the interests of some individuals. There will be some creative destruction.

Addressing these practical challenges requires a multifaceted approach. First, we ought to ensure that the transition to AI-enabled legal systems is gradual and inclusive. Once again, this includes providing ample training and support for legal professionals, ensuring they have the skills and confidence to work effectively with AI. A realistic and empathetic approach to resistance is also warranted. Change can be difficult, and people naturally have reservations about new technologies. Specifically, some may perceive infinite AI that plays a key role in legal decision-making as contradicting humanism, detaching people from grounded human experiences and meaning. By acknowledging these concerns and providing reassurances, we could alleviate some of these fears and build trust.

Policies and programs should support those who may lose or be harmed by digital transformation. This could include reskilling programs for legal professionals and initiatives to increase digital literacy. Fostering a culture of continuous learning and adaptation in the legal field would serve the legal profession well. Integrating AI into legal systems is not a one-time event, but an ongoing process that will continue to deepen and evolve. By embracing this mindset, we can better navigate the human-related challenges that come with this transformation.

## VI. *Concluding Remarks*

“The best way to predict the future is to invent it.”<sup>156</sup>

— Alan Kay

The use and abuse of technology coincides with the past several centuries of human history. Approximately two centuries ago, the rise of capitalism began a significant transformation in global socio-economic structures. In recent decades, numerous nations have experienced substantial growth in GDP, which, in turn, has led to pronounced disparities in income distribution both within and among countries. While the establishment of capitalist institutions spurred improvements in living standards, it also precipitated a vast apparatus of colonial exploitation to fuel the industrialization of powerful nations during the Industrial Revolution. Alas, the technological advancements of this era are also intrinsically linked to the contemporary climate crisis.

We now inhabit the information age, a major paradigm shift embodied by the digital revolution—also sometimes referred to as the Third Industrial Revolution. This revolution marks a transition from mechanical and analog electronic technologies to digital electronics. It

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<sup>155</sup> See for example, Erik Brynjolfsson & Andrew McAfee, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (New York: WW Norton & Company, 2014); James Feigenbaum & Daniel P Gross, “Answering the Call of Automation: How the Labor Market Adjusted to the Mechanization of Telephone Operation” (2020) National Bureau of Economic Research Working Paper No 28061 [working paper].

<sup>156</sup> Attributed to Alan Kay in 1971 at the Xerox Palo Alto Research Center (Xerox PARC).

is characterized by the adoption and widespread diffusion of digital computers and digital record-keeping.

Most notably, the dawn of AI and its projected trajectory presents a myriad of opportunities, challenges, and risks to humanity. Technology is morally neutral; what truly matters is how society uses it. Our choices will determine the trajectory of new technologies and the extent to which their impacts are positive, well-being-enhancing, and properly distributed. Therefore, we must engage in strategic planning and deliberation regarding the projected changes and their extensive implications for society and our legal systems.

Current law and technology scholarly work offers invaluable insights into the challenges that big data and AI will pose to law and humanity more generally. It also provides imperative insights into how AI and technology can improve the legal system, and how the law may or should change in response. However, this scholarship tends to lose the forest for the trees: It underestimates the potential of technological developments to profoundly alter the very nature of law and virtually any aspect of it.

This article tackles this issue head-on. It suggests that an AI-enabled legal system is both a phenomenon and a technological development with far-reaching implications. With proper anticipation and planning, such a system could advance legal harmony, facilitate access to justice, democratize the law, dramatically reduce court caseload, optimize the use of scarce resources, and enhance law-making and enforcement efforts. After all, the envisaged system will borrow from both common law and civil law systems—and others besides. While neither the common law nor the civil law system was designed to accommodate and leverage new technological capabilities, the proposed system can evolve and adapt to human needs, just as the common law evolves through the practice of precedent. As for civil law, the tradition of codification and viewing law more as science—rather than art—with its propensity towards consolidation of principles, rigorous deduction, and the pursuit of one correct answer, may lend itself to automation.

Indeed, an AI-enhanced legal system can transcend common law and civil law systems by borrowing from and developing insights from the precedents of common law and embracing and elaborating upon the principles informing the codified structure of civil law. It can engender a future where law is highly specified and dynamically responsive, not constrained by the traditional paradigms of either system. That said, LexOptima is not a panacea. Whereas its potential is exciting, it also demands careful consideration, gradual progress, multi-stakeholder discourse, and ethical stewardship.

This article analyzed and highlighted the potential of AI-enabled legal systems. A crucial aspect yet to be addressed is identifying the entities responsible for executing the proposed legal framework. Governments, often the default implementers, may not be ideally suited due to their own agendas, limitations, and biases. This challenge is compounded by public skepticism towards political institutions, rooted in past inefficiencies and adaptability failures. While this institutional challenge is beyond this paper's scope, it is clear that the inevitable advancements in technology will compel governments to confront and address these issues more directly.

The future of AI is impossible to predict with precision, yet it is up to us to write it. Scholars and thinkers often react to the emergence of new technologies with rather distinct prognoses: that things will get better, that they will get worse, or that things will turn towards the unconventional. Regardless of which of these analytical perspectives one subscribes to, the rapid and significant development of technologies signals that now is the time to prepare for major technological and legal disruptions. A robust conversation about the future of AI in legal

systems is crucial to ensure better outcomes. The perils of being unprepared are too consequential to overlook.