

CHAPTER 10

Good Governance Principles for Law Firms Using Artificial Intelligence

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Introduction

Long before Artificial Intelligence (AI) became ubiquitous in our daily lives, people were both transfixed by and wary of it. A Greek myth tells the story of Talos, a giant bronze automaton created by Hephaestus at the request of Zeus to protect Crete from invaders by circling the island's shores three times a day. Jewish folklore has the Golem, a creature formed of clay. While the Golem's purpose is to help humans, in many tales, the artificial creature veers off its pre-destined path and turns on its creator. Starting from the 1940s, robots and AI became a fixture in science fiction, depicted both as humanity's saviors and harbingers of its destruction.

In his 1942 collection of short stories, *I, Robot*, science fiction writer Isaac Asimov proposed the Three Laws of Robotics:

- The First Law: A robot may not injure a human being or, through inaction, allow a human being to come to harm.
- The Second Law: A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.
- The Third Law: A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.¹

These laws were intended to ensure that AI is used for the benefit of humankind, preventing it from turning against its human creators and averting a tech-apocalypse.

While, nowadays, almost all of us use AI on a regular basis to some extent with no imminent dystopia in sight, AI wariness persists.² In March 2023, the Future of Life Institute published an open letter calling for a six-month moratorium on the development of the most advanced forms of AI.³ Signatories included Elon Musk of Tesla and SpaceX, as well as Apple Computers co-founder Steve Wozniak. The open letter asked:⁴

Should we let machines flood our information channels with propaganda and untruth? Should we automate away all the jobs, including the fulfilling ones? Should we develop nonhuman minds that might eventually outnumber, outsmart, obsolete and replace us? Should we risk loss of control of our civilization?

According to the signatories, “[p]owerful AI systems should be developed only once we are confident that their effects will be positive and their risks will be manageable [and t]his confidence must be well justified and increase with the magnitude of a system’s potential effects.”⁵ The letter further urged AI labs and independent experts to “jointly develop and implement a set of shared safety protocols for advanced AI design and development that are rigorously audited and overseen by independent outside experts.”⁶

Although a global AI regulatory or oversight body has yet to emerge, various jurisdictions, institutions and tech actors have proactively implemented self-regulation through the adoption of AI development and usage standards and guidelines.

The most prominent development in this regard has come from the European Union – after almost three years of extensive negotiations, the European Parliament adopted Regulation 1689 on harmonized rules on artificial intelligence (EU AI Act).⁷ The EU AI Act adopts a risk-based approach to AI regulation, essentially creating four risk categories for AI systems: unacceptable risk (prohibited),⁸ high risk (regulated),⁹ limited risk (regulated *lite*),¹⁰ and minimal risk (unregulated).¹¹ The EU AI Act applies to: (a) providers putting AI systems on to the EU market or putting AI systems into service in the EU, (b) deployers of AI systems located or established in the EU, (c) AI system providers and deployers established or located outside the EU, where the output of the AI system is to be used in the EU, (d) AI system importers and distributors, (e) product manufacturers who place on the market or put into service AI systems together with their product, (f) authorized representatives of non-EU AI system providers, and (g) affected persons that are located in the EU.¹² Breaches may result in fines of up to EUR 35 million or 7 % of annual worldwide turnover.¹³

On March 2024, the United Nations adopted Resolution A/78/L.49 on Seizing the opportunities of safe, secure and trustworthy artificial intelligence systems for sustainable development, which aims to create a unified international approach to AI governance among UN Member States.¹⁴ The OECD first published its Principles on Artificial Intelligence in 2019; an amendment followed in May 2024.¹⁵ In September 2018, the State of California endorsed the 23 Asilomar AI Principles on the ethical development and use of AI.¹⁶ Other notable private sector examples of AI principles and guidelines include the Google AI Principles¹⁷ and the Microsoft Responsible AI Standard.¹⁸

The legal sector will not be exempt from adopting reasonable standards of practice with respect to AI. Law firms are increasingly utilizing AI in fulfilling their day-to-day tasks, including electronic discovery and predictive coding, litigation analysis and predictive analysis, contract management, due diligence reviews, “wrongdoing” detection, legal research, and deception detection.¹⁹ Some service providers even offer full-blown AI-based legal assistants, such as Harvey, which has partnered with OpenAI “to build a custom-trained model for legal professionals,”²⁰ and Jus Mundi’s AI Assistant, which offers services such as case summaries, information retrieval, focused legal analysis, case application simulation and case precedent extraction.²¹ Given its broad scope, the EU AI Act will impact law firms that use or develop AI both within and outside the EU if their activities affect the EU market or its citizens. Establishing effective frameworks for compliance and governance will be crucial to navigating this increasingly regulated sector successfully.

While it currently seems unlikely that the legal world is edging towards a technological dystopia or wide-spread breaches of applicable regulations, professional organizations are becoming conscious of the need to establish rules surrounding the use of AI in a legal context. In 2019, the American Bar Association adopted Resolution No. 112 urging courts and lawyers to address the emerging ethical and legal issues related to the use of AI in the practice of law.²² In September 2024, the IBA’s Artificial Intelligence Working Group published a comprehensive multi-jurisdictional and organizational overview of the guidelines and regulations on the use of AI as a professional tool.²³ Other recent efforts include the England and Wales Bar Council’s guidance on the use of large language models (LLMs)

to barristers and chambers,²⁴ the UK Legal Services Board statutory guidance on the regulation of AI,²⁵ the California Bar Association's Guidelines for the use of Generative AI in the practice of law,²⁶ and the recently published Silicon Valley Arbitration & Mediation Center guidelines on the use of AI in arbitration.²⁷ In the evolving landscape of legal technology, the integration of AI into law firm operations introduces both unparalleled opportunities and significant ethical considerations. The intrinsic challenge is accommodating rapid technological advances within a relatively stagnant profession.

The discussion on how law firms should use AI has barely begun, and there is no industry-wide consensus on best practices. In this chapter, I propose nine good governance principles for the use of AI by law firms:

- 1 Legal & Ethics Standards: Law Firms Should Comply with Applicable Legal & Ethical Standards
- 2 Client Confidentiality & Privacy: Law Firms Should Ensure that AI is Used in Line with Client Confidentiality & Privacy Standards
- 3 Client Awareness & Consent: Law Firms Should Ensure Client Awareness of & Consent to the Use of AI in the Provision of Legal Services
- 4 Human Oversight & Approval: Law Firms Should Ensure Human Oversight & Approval Mechanisms for AI-Generated Work Product
- 5 Transparency & Explainability: Law Firms Should Ensure that the AI they Use is Transparent and its Generated Work Explainable
- 6 Ultimate Responsibility: Law Firms Bear Ultimate Responsibility for any AI-Generated Work Product
- 7 AI Training: Law Firms Should Provide Mandatory AI Training & Commit to Continuous Learning
- 8 Minimizing Bias and Maximizing Diversity: Law Firms Should Use AI in Accordance with the Principles of Non-Bias, Fairness & the Promotion of Diversity & Inclusivity
- 9 Managerial & Human Resources Decisions: Law Firms Should Use AI in Management and Human Resources Contexts in Good Faith

Several of these proposed principles are intimately intertwined and overlap in some respects. They are neither stringent nor exhaustive, but rather an overview of themes that should form the basis of the AI good governance discussion in law firms.

1 Legal & Ethics Standards: Law Firms Should Comply with Applicable Legal & Ethical Standards when Using AI

Compliance with applicable laws and ethics standards is the backbone and the absolute minimum standard of any legal practice. If a law firm chooses to follow a ‘bare bones’ policy in its deployment of AI, the firm should ensure that its use of these technologies complies with any applicable legal and ethical standards governing the practice of law.

The legal standards that come into play when using AI in a law firm context can be divided into four broad categories: (1) laws governing the practice of law and unauthorized practice of law (UPL) regulations, (2) ethics rules and rules of professional conduct, (3) data protection laws, and (4) anti-discrimination and fairness laws.²⁸

First and foremost, law firms should ensure that their use of AI does not amount to the unauthorized practice of law. This is a critical concern for firms since AI applications, ranging from document review to legal research and prediction of case outcomes, could potentially automate tasks traditionally performed by licensed legal professionals. Firms should carefully delineate the role of AI in supporting legal decision-making, ensuring that final judgments remain the purview of qualified human lawyers (*see* Principle 4 on human oversight and Principle 6 on ultimate responsibility). This involves setting clear guidelines on the limitations of the role of AI in the legal analysis, advice, and client representation, ensuring that AI tools are used to augment, not replace, the expertise of licensed attorneys.

Ethical standards also play a crucial role in this basic governance principle. This includes maintaining the integrity of the legal profession, upholding duties to clients, and avoiding conflicts of interest. Law firms should ensure that the use of AI aligns with the ethical obligations to act in the best interests of their clients, including maintaining confidentiality (*see* Principle 2 on confidentiality and privacy) and providing competent representation and informing clients about the extent to which AI tools are employed in handling their cases (*see* Principle 7 on AI training). Ethical considerations also extend to transparency about the use of AI in legal work (*see* Principle 3 on client awareness, and Principle 5 on transparency

and explainability), and may likewise play a role in how law firms interact and treat their employees (*see* Principle 9 on using AI in human resources and management).

Data security and protection goes hand in hand with confidentiality. As Principle 2 will discuss in more detail, data protection laws such as the General Data Protection Regulation (GDPR) may apply to AI-processed client information and may require law firms to take additional steps in ensuring data security.

Law firms may likewise be subject to legal requirements relating to anti-discrimination. Because AI outputs are only as good as the data the AI program has been trained on, AI-generated work product may be at odds with anti-discrimination requirements that are generally adopted to correct the historical biases that are likely to be reflected in the datasets (*see* Principle 8 on minimizing bias).

Finally, and perhaps most importantly, law firms must ensure they understand how AI operates, a responsibility increasingly mandated by many professional organizations (*see* Principle 7 on AI training).

2 Client Confidentiality & Privacy: Law Firms Should Ensure that AI is Used in Line with Client Confidentiality & Privacy Standards

Attorney-client privilege is the cornerstone of the legal profession,²⁹ making confidentiality and privacy the most important aspect of any AI use by law firms.³⁰ As AI systems process vast amounts of data, some of which may be highly sensitive, law firms should implement robust safeguards to prevent unauthorized access or breaches, aligning with legal requirements such as the GDPR³¹ in Europe or similar regulations elsewhere.³²

For example, the GDPR provides that personal data has to be: “processed lawfully, fairly and in a transparent manner”,³³ “collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes”,³⁴ “adequate, relevant and limited to what is necessary in relation to the purposes for which they are pro-

cessed”,³⁵ and “accurate and, where necessary, kept up to date”.³⁶ Other countries likewise have data privacy laws similar to the GDPR that may also apply depending on the jurisdiction the law firm operates in.³⁷

Accordingly, any AI used by a firm must be designed and operated to uphold the highest standards of client confidentiality and privacy: client data should be encrypted, and access to it, as well as the use of AI to handle that data, must be tracked and closely controlled. Firms should also regularly audit their AI systems for potential vulnerabilities and invest in appropriate internal or external technical support and expertise.

Firms should likewise be proactive in staying informed about the evolving legal and ethical implications of AI technologies. This may involve continuous education for legal professionals, regular reviews of AI use policies in light of new legal and technological developments, and active engagement with debates and policy-making processes regarding the future regulation of AI in the legal sector.

Finally, in addition to ensuring its own data protection policies, law firms should carefully consider which third party AI service-providers to use and review their data protection policies and standards, as well as how they handle and encrypt data, and inform clients of data breaches.

3 Client Awareness & Consent: Law Firms Should Ensure Client Awareness of & Consent to the Use of AI in the Provision of Legal Services

Clients should be aware that a firm uses AI, and consent to it. This principle can be inferred from ABA Model Rule 1.6, which provides that “[a] lawyer shall not reveal information relating to the representation of a client unless the client gives informed consent” and allows implicit disclosure only in certain circumstances.³⁸ In addition, the same rule requires lawyers to “make reasonable efforts to prevent the inadvertent or unauthorized disclosure of, or unauthorized access to, information relating to the representation of a client”.³⁹

Firms could obtain client consent on an *ad hoc* basis for specific purposes or generally. Ensuring client awareness and obtaining explicit consent before deploying AI-driven processes are foundational to maintaining a transparent and trust-based relationship between law firms and their clients and ensuring that the firm's attorneys comply with any applicable ethics obligations. Disclosure of the use of generative AI by companies is an ongoing debate across many sectors,⁴⁰ including legal services.⁴¹ In a law firm context, disclosing too much may unduly overburden clients with details of a firm's day-to-day practices that may have little impact on the quality of the clients' experience. Some suggest that firms should wait for clients to request such disclosures, while others opt for a more "prudent" approach of disclosure across the board.⁴² While there currently does not seem to be a hard and fast rule on how firms should handle AI from the perspective of client consent, existing ethics rules and guidelines could be read in a manner that requires at least some disclosure.

For example, the ABA Model Rules (which many US states have adopted verbatim, or with modifications) provide that lawyers must "reasonably consult with the client about the means by which the client's objectives are to be accomplished" and "explain a matter to the extent reasonably necessary to permit the client to make informed decisions regarding the representation."⁴³ The California Bar's Standing Committee's on Professional Responsibility and Conduct Guidelines specifically recommends that "[a] lawyer should consider disclosure to their client that they intend to use generative AI in the representation, including how the technology will be used, and the benefits and risks of such use."⁴⁴ Disclosure would also align with data protection laws, such as the GDPR, which mandates clear consent for processing personal data.⁴⁵

The rationale behind requiring client awareness and consent is manifold. Primarily, it safeguards the client's privacy and ensures their data is handled in a manner they have approved. Given the potential of AI technologies to access, analyze, and derive insights from vast datasets, clients must fully understand and agree to these capabilities being applied to their information. Furthermore, the principle of client awareness and consent also mitigates the risk of reputational damage to the firm. In instances where AI might inadvertently breach confidentiality or privacy

without clear client consent, the fallout could be severe, not just in legal terms but also in client trust erosion.

Should the law firm seek to develop its own AI analytics tool (either in-house or by collaborating with third party developer) based on the confidential client information it holds, obtaining client consent may involve additional steps, and the consideration of additional issues such as conflicts of interest.⁴⁶

In keeping with the more “prudent” approach, firms should obtain client consent *before* using or developing AI, and such consent should be informed. The requirement for *informed* consent will later tie in with Principle 6 requiring mandatory AI training and continuous learning for attorneys. Principle 3 likewise ties in with Principle 2 on confidentiality and privacy – obtaining prior consent from the client would define the boundaries within which the AI that a firm uses may analyze, learn from and use clients’ data.

To effectively implement this principle, law firms may consider the following steps:

Disclosure of AI use and written consent

Firms could disclose their use of AI to clients via the law firm’s website,⁴⁷ the engagement letter for the whole matter,⁴⁸ via an annex to the engagement letter detailing the firm’s use of AI, or on an *ad hoc* basis if client consent is necessary for the use of a specific AI or an AI for a specific purpose (e.g. document management, document production, damages calculation, etc.). A firm’s disclosure could cover what types of AI are used, the purposes of such use, and any data processing that AI will perform. Ideally, to hedge against the risk of potential client complaints, firms should ensure that the client consents to the use of AI in writing, whether it be by signing a written agreement or via written communication. To appease any fears or concerns, law firms should likewise clearly outline the measures in place to protect client data in AI applications, including data encryption, access controls, and any third-party audits of AI systems for security vulnerabilities.

Giving clients the option to opt-out

Law firms should consider providing clients with the option to opt-out of AI-driven processes if they prefer traditional legal services. This respects client autonomy and provides an alternative for those uncomfortable with AI, especially when the matter in question is highly sensitive. Such an opt-out may ultimately increase costs of representation and this should also be spelled out to the client so that they may consider this factor when making the decision on AI use.

Client Education

Firms should aim to offer educational resources or sessions for clients to understand the benefits and risks associated with the use of AI. Clear communication about how AI can improve legal outcomes, as well as its limitations, helps clients make informed decisions.

Continuous Dialogue

Law firms should maintain an open line of communication with clients about AI use, addressing any concerns or questions they may have promptly. As AI technologies evolve, firms should keep clients informed about new developments or changes in how AI is or could be used within the firm.

Ultimately, when deciding on the extent and form of disclosure, a law firm's guiding principles should be the client's best interest and the confidentiality of their data, coupled with the firm's own interest in abiding by ethics norms and minimizing the risk of malpractice.

4 Human Oversight & Approval: Law Firms Should Ensure Human Oversight & Approval Mechanisms for AI-Generated Work Product

When employing AI tools, law firms should ensure the prioritization of human autonomy as it is the attorney, not the AI, who is licensed to practice law. The integration of AI into legal practices necessitates a careful balance between leveraging technology and ensuring an ethical, accurate, and responsible work product. A cornerstone principle in achieving this balance will be ensuring that all AI used by law firms has human oversight

and approval mechanisms. This principle underscores the importance of human judgment in internal decision-making processes, ensuring that AI tools serve as aids rather than replacements for the nuanced and complex variety of tasks performed by attorneys. Attorney sign-off on AI-generated work product should therefore be mandatory.⁴⁹

This requirement could be considered akin to requiring lawyer oversight over non-lawyers employed by the firm. The ABA Model Rules of Professional conduct provide that supervising attorneys must make “reasonable efforts to ensure that the firm has in effect measures giving reasonable assurance that the person’s conduct is compatible with the professional obligations of the lawyer” and may be held responsible “for conduct of such a person that would be a violation of the Rules of Professional Conduct”.⁵⁰ A recent law firm report on professional responsibility likewise notes that “[AI may] introduce significant risks to the profession, particularly whilst AI tools remain in their infancy” and that “[t]hose risks are magnified when lawyers seek to rely upon open AI platforms that have extracted data from multiple unverified sources”.⁵¹ The report underlines that “[f]irms that fail to introduce appropriate safeguards that include human oversight to authenticate the AI-generated content can expect an increased exposure to [personal injury] claims.”⁵²

Human oversight in AI utilization involves regular monitoring and evaluation of AI systems and/or their outputs by legal professionals to ensure their outputs are accurate, relevant, and free of biases. Such oversight is critical in maintaining the integrity of legal proceedings and the protection of client interests. AI systems, while powerful, can still generate errors, misunderstand context, or produce biased results based on their training data. Legal professionals must therefore be involved in reviewing and approving AI-generated outputs, ensuring they meet corresponding human standards of work product and relevant ethical guidelines.

“Human oversight and approval mechanisms” will have different meanings depending on whether it applies to AI development or AI use. In the context AI system development, “human oversight and approval mechanisms” refers to the processes and safeguards put in place to ensure that human judgment plays a central role in the operation, decision-making, and outcomes of AI systems. These mechanisms are designed to maintain

human control over AI, allowing for the intervention, evaluation, and correction of AI actions when necessary (for example, when the AI's output is incorrect, biased, etc.). Since AI outcomes are dependent on the data it has been trained on—garbage in, garbage out—human oversight ensures that less garbage gets into the AI data training set.⁵³

In the context of *using* AI programs, “human oversight and approval mechanisms” refers to the strategies and processes a company implements to monitor, evaluate, and validate the actual decisions and outputs of AI systems created by external developers.⁵⁴ This ensures that AI-generated outputs are consistently correct and in line with a law firm's values and policies, as well as any applicable laws and ethics rules. For example, in a law firm using a third-party AI for predictive analytics in litigation outcomes, each case prediction made by the AI should be reviewed by an attorney who assesses the AI's analysis against the firm's historical case outcomes and their own legal expertise. If the attorney approves, the AI's insights can then be used to inform the client's legal strategy. This ensures that while the firm benefits from AI's ability to analyze vast amounts of data and predict outcomes, the legal advice remains grounded in human judgment and experience. AI should not undermine human autonomy or decision-making, and attorneys retain the final say in legal decisions. Any AI-generated recommendations or conclusions must be presented as options, with clear opportunities for human review and modification.

These mechanisms should include protocols for the validation of AI technology before its deployment in sensitive legal tasks. Additionally, procedures should be established for the ongoing review of AI outputs, with clear criteria for what constitutes acceptable performance and guidelines for addressing any discrepancies or errors identified during human oversight. By ensuring that AI tools are always under the watchful eye of legal professionals, law firms can harness the benefits of technology while upholding the highest standards of legal practice and ethical responsibility.

5 Transparency & Explainability: Law Firms Should Ensure that the AI They Use is Transparent and the Work It Generates Explainable

AI operations and decision-making processes must be transparent and understandable to clients and legal professionals, providing clear explanations for all steps involved in arriving at their outputs. Firms must also ensure that clients and lawyers can readily access this information to be able to more fully understand the context of those outputs. This commitment to openness is fundamental in maintaining trust and accountability in the use of AI within the framework of legal practice.

This type of transparency of course involves several layers, starting from the disclosure of the types of AI technologies used by the firm, down to the more specific methodologies underlying their application to the tasks at hand. Law firms arguably should clearly communicate the capabilities and limitations of AI systems to clients to prevent unrealistic expectations and ensure that all parties understand the extent of the role of AI in the provision of legal services.

An example to illustrate the point is the increasing use of AI-driven document analysis tools that help law firms quickly review and categorize large volumes of documents. Transparency in this context would involve the law firm openly communicating several key aspects of the AI tool to its clients and attorneys, such as:

AI Tool Capabilities and Limitations

Firms should explain that the AI tool can quickly process and categorize documents based on keywords, phrases, and contextual similarity; they should also disclose that the tool may not perfectly interpret documents with complex legal jargon or nuanced language and that manual review would still be necessary for critical documents.

Data Usage and Security

Information on what types of data the AI tool accesses, how the data is used, and the measures in place to protect client confidentiality and data security.

Decision-Making Influence

Firms should clarify that the AI tool is used to aid in the preliminary stages of document review to expedite the discovery process but that final decisions on the relevance and use of documents in legal proceedings are made solely by human lawyers.

Developer and Vendor Information

Firms should provide details about the AI tool's developer, the vendor, and any third-party evaluations of the tool to assure clients of its credibility and reliability.

Compliance and Ethical Considerations

Firms should outline how the use of the AI tool complies with their professional standards and ethical guidelines, and the ways in which they ensure that its use does not compromise the integrity of their work or on any adjudicative processes they engage in on behalf of clients.

These types of clear messaging both to internal and external stakeholders promotes trust and confidence among clients and ensures that the use of AI tools is understood and accepted by all parties involved.

Explainability complements transparency by requiring that AI systems do not just produce outcomes but also offer detailed insights into the reasoning behind these outcomes. This is particularly important in the legal context where certain decisions can significantly impact case strategies and outcomes. Explainable AI helps ensure that automated decisions can be interpreted and justified in legal terms. This principle likewise complements Principle 4 on human oversight, ensuring that both clients and firm AI-users are aware of how AI work product is generated and ultimately used by the firm.

An example of explainability could involve the law firm using an AI tool to predict the likely outcome of a case based on historical data from similar cases. This tool might analyze factors such as the underlying facts of the case, relevant legal precedents, the judges or arbitrators involved, and previous rulings in similar situations. It then might provide a percentage likelihood of winning or losing the case. Explainability in this context means that the AI tool would not simply spit out a prediction like "65%

chance of winning the case” but also provide a breakdown of how it arrived at this conclusion. For instance, the tool could explain that:

- The prediction is based on a dataset of 500 similar cases from the past five years.
- Cases with similar facts had a 70%-win rate when presided over by Arbitrator X, who is assigned to this case.
- However, recent changes in relevant laws have decreased the win probability by 5%.
- This outcome also considers the performance of the appointed legal representative, who has a historical win rate of 60% in similar cases.

By providing these details, the AI tool essentially explains *how* it arrives at a certain conclusion. Lawyers and clients can see not only the predicted outcome but also the rationale behind the prediction. This level of explainability allows lawyers to better assess the tool’s reliability and to decide whether to trust its guidance in formulating their legal strategy. Furthermore, it enables clients to understand the factors influencing their case, fostering greater trust and making the legal process more participatory.

6 Ultimate Responsibility: Law Firms Bear Ultimate Responsibility for any AI-Generated Work Product

Law firms necessarily take full responsibility for the actions and decisions made by its AI. This principle underscores the essential understanding that it is the attorney, not the AI, who is licensed to practice law. In this vein, the responsibility for ensuring the accuracy, legality, and ethical compliance of AI-assisted work squarely rests on their shoulders. Assuming ultimate responsibility over work product is therefore a fundamental aspect of good AI governance in law firms and is a natural complement to Principle 4 requiring human oversight and approval mechanisms for AI-generated work product.

Firms should put in place internal accountability structures to ensure that senior stakeholders within the firms (i.e., partners, counsel and/or senior associates) are aware of and can oversee (and therefore be accountable for) how AI is used on specific client matters.

Certain exceptions to this principle could potentially be made when firms, in agreement with a client, employ a third-party AI-service provider who has assumed full responsibility and liability for the resulting work product.

Law firms should likewise revise their insurance policies, to ensure that they cover any potential AI-generated errors in work product. As Reuters points out, “AI-related claims can take many forms, including, for example, alleged violations of employment law, breaches of data privacy statutes, breaches of fiduciary duties or professional obligations, violations of securities laws, intellectual property infringement, or any other number of events, acts or omissions.”⁵⁵ Firms will typically take out professional liability, general liability and cyber security insurance, however, as AI technology continues advancing rapidly, new types of insurance may become available.⁵⁶ Securing insurance that specifically covers AI-generated errors is a pragmatic step toward mitigating risks associated with the use of emerging technologies. It would protect law firms financially and signal to clients that firms take their professional responsibilities seriously, even in the face of innovative legal tech applications.

7 AI Training: Law Firms Should Provide Mandatory AI Training & Commit to Continuous Learning

The ethical duty of competence required of attorneys must adapt and evolve in response to the development and integration of new technologies within the practice of law. While we mostly think of AI as a monolith, the term encompasses a multitude of techniques and approaches. For example, machine learning encompasses supervised learning (further divided into classification and regression), unsupervised learning (that includes clustering), and reinforcement learning. The most complex form of AI is deep learning that utilizes deep neural networks. Each method has its own capabilities and shortcomings and lawyers should have the requisite knowledge to understand how the AI they are using works. Firms should foster an environment where continuous education on AI technologies and their use in legal practice becomes an integral part of professional development.

According to the 2012 revised ABA Model Rules, lawyers must “provide competent representation to a client [which] requires the legal knowledge, skill, thoroughness and preparation reasonably necessary for the representation.”⁵⁷ This includes the requirement to stay abreast of technological developments.⁵⁸ Since 2012, many states have “either adopted the amended comment or otherwise advised attorneys to stay abreast of technology as it relates to the practice of law.”⁵⁹ According to the American Bar Association, so far 39 jurisdictions have adopted a statement on tech competence.⁶⁰ The bar associations of some states now likewise require that lawyers complete technology training as part of their ongoing continuing legal education (CLE) requirements.⁶¹ At the end of 2020, the Quebecois Lawyers’ Code of Ethics likewise added an explicit requirement that lawyers develop tech skills and keep them up to date.⁶²

It is worth noting the duty of competence extends not just to counsel, but also to arbitrators, many of whom work in law firms or have their own independent legal practices. In addition to the professional rules of conduct examples mentioned above, the new UNCITRAL Code of Conduct for Arbitrators in International Investment Dispute Resolution likewise requires that “an arbitrator [...] [p]ossess the necessary competence and skills and make all reasonable efforts to maintain and enhance the knowledge, skills and qualities necessary to perform [their] duties.”⁶³ While the commentary focuses on “professional knowledge and experience in investment law and public international law as well as linguistic skills,” the term “necessary competence” should be understood in the broad sense, so it could potentially include technological competence as well.⁶⁴ Requiring technological (and specifically AI) competency of arbitrators may not yet have become hard law; however it is undeniable that as technology advances further and becomes more ubiquitous, there will be more pressure on arbitrators to become tech-literate.⁶⁵

Implementing Principle 7 would require law firms to invest in training their professionals not just in the use of AI but also in understanding its limitations and potential pitfalls. Training should include not just the use of specific AI models (e.g., document review programs, AI-powered research tools, etc.) but also general training on AI, so that attorneys are better able to recognize potential AI blind spots and address them.

Despite AI's remarkable capabilities and widespread applications, it is not infallible. A significant limitation of AI systems, particularly (LLMs), is their propensity for generating "hallucinations" or outputs that are factually incorrect or nonsensical. These errors can arise from biases in the training data or the inability of the model to fully understand complex contexts. AI models are fundamentally limited by the data they are trained on; they lack the ability to think abstractly or engage in deep reasoning. Consequently, they can make mistakes when presented with scenarios or questions that deviate from their training experiences. These limitations underscore the necessity for careful oversight and validation of AI outputs, especially when employed in critical decision-making roles.

A very simple example of why training for lawyers using AI is both necessary and helpful is understanding how LLMs such as the ones relied on by ChatGPT respond to prompts.

LLMs are advanced artificial intelligence systems, specifically designed to digest and interpret extensive volumes of natural language data. Essentially, LLMs are artificial neural networks that use complex machine learning algorithms and undergo training on expansive data sets, enabling them to decipher the complexities and nuances of human language. LLMs can produce responses that closely mimic human conversational patterns in reaction to a broad spectrum of textual prompts by analyzing the linguistic information they are fed, constructing an intricate internal framework that mirrors the language structures they learn from. With this framework in place, they can then process any given natural language input and generate remarkably human-like text, making them invaluable tools in bridging the communication gap between humans and machines.⁶⁶

The way prompts are worded significantly shapes the responses from LLMs. Precise and clear prompts lead to more relevant, focused, and accurate answers, as the model generates responses based on the instructions given. When prompts are vague, they can result in generalized or off-target responses because the model tries to interpret the intent and fill in the gaps with assumptions.⁶⁷ The specificity of a prompt helps the model understand the desired depth of information, the context and the particular angle of a topic. The structure of the command within the prompt also

dictates the format of the response; for example, asking to “list the steps” will produce a bullet-point format, while “discuss in detail” indicates a need for a narrative format. Precise wording is crucial for reducing ambiguities that could lead to misinterpretation, and, in turn, mistakes in LLM-generated replies. If law firms are equipped with the knowledge to question and critically assess AI recommendations and outputs, they can ensure better results and minimize potential errors when advising clients.

Educating lawyers on AI and its uses is likewise indispensable in helping identify and mitigate the risks associated with scams such as deepfakes and voice cloning.⁶⁸ This may be crucial when examining potentially doctored evidence⁶⁹ and to recognize when scammers may be impersonating clients or members of the firm.⁷⁰ As these technologies become more sophisticated, the potential for their misuse in fraudulent activities increases, posing significant threats to business integrity, security, and trust. Understanding the mechanics, capabilities, and weaknesses of AI-generated content will allow firms to implement effective strategies for scam detection and prevention.⁷¹

8 Minimizing Bias and Maximizing Diversity: Law Firms Should Use AI in Accordance with the Principles of Non-Bias, Fairness & the Promotion of Diversity & Inclusivity

Firms should ensure that their AI is free from biases that could lead to unfair treatment of clients, attorneys, and staff or influence legal outcomes based on race, gender, age, or other personal characteristics. How could AI-generated work product be biased? A fundamental concept and concern of machine learning (which all predictive and generative AI is based on) is the garbage in, garbage out principle. It essentially means that the quality of output is determined by the quality of the input. If biased, flawed, incorrect, or low-quality data is fed into an AI system, the output will also be flawed or inaccurate. This principle underscores the importance of data quality in obtaining reliable and valid results from AI systems.⁷²

Before we delve into the legal sphere, let us look at a practical experiment conducted by quantitative futurist Amy Webb. Webb asked AI image generator MidJourney to produce an image of a CEO of a large hospital sys-

tem.⁷³ Note that MidJourney produces images in fours. On her first try, Webb got an image of four “mature” white men standing in front of imposing modern hospital buildings. Webb was not surprised as “overwhelmingly, the largest percentage of the Fortune 500 CEOs [...] are mature white men.” She tried again, this time asking MidJourney to generate an image of a CEO of a mid-sized hospital system. MidJourney generated images of four “shockingly attractive” men that were slightly younger and pictured standing in office spaces. Webb then tried asking for the CEO of a hospital system in a very small rural village. Again, four pictures of white men, two of them young, two middle-aged, this time standing in front of smaller hospitals. Webb got frustrated, asking herself, “what the hell is it going to take for the system to produce a woman?” She changed strategies and asked the program to generate the image of a CEO of a hospital system in Jackson Mississippi (which, according to the US Census Bureau has the most women in its population). Once again, the result was four images of middle-aged and senior white men. At last, she asked MidJourney to generate an image of a CEO of a company that makes tampons. And even this prompt produced images of four white men.

One example of how data-driven bias could affect AI used by law firms is arbitrator selection. While currently platforms such as JusConnect (tag-line “Select the perfect arbitration professional”)⁷⁴ are more akin to databases, in the future, they may evolve into more sophisticated AI-backed arbitrator selection services where you could add details of the case, such as industry, amount in dispute, what party you are representing, the characteristics you are looking for, and the system would generate the name of your “perfect” arbitrator. One data point that this hypothetical arbitrator selection tool would most certainly look at is experience and previous appointments. In 2018, researchers from the University of Oslo determined the top 25 investment treaty arbitrators by appointment based on a dataset of 1039 cases.⁷⁵ Out of the 25, only two were women, and not a single person was, for example, Black.⁷⁶ It would not be extreme to speculate that the hypothetical AI tool would likely select a white male investment treaty arbitrator when prompted.

Of course, a good AI arbitrator selection tool would look at more than just the number of appointments of any given person, but the underrepresentation of certain groups as arbitrators will undoubtedly influence the AI’s

algorithm, and this is not something that can or should be ignored. As Webb concludes, bias in AI is not going to disappear because people talk about it or acknowledge it as a problem – AI only reproduces the information it has been fed.⁷⁷ As long as this dataset is not improved – either expanded or manually tweaked by human oversight – biased results will persist.

Avoiding biased results in AI when the underlying datasets reflect existing biases is a complex but essential challenge. Some of the strategies that could help mitigate bias and promote fairness in AI systems are:⁷⁸

Diverse Data Collection

AI programs should be trained on expanded datasets that include a wide range of sources to capture a more comprehensive and diverse representation of individuals, and AI providers and developers should actively seek data from underrepresented groups to ensure their inclusion in the dataset, helping to balance the representation across different demographics.

Bias Detection and Remediation

Legal AI providers and developers should regularly audit datasets for biases by analyzing the representation and outcomes of different demographic groups, as well as apply statistical techniques or machine learning algorithms designed to identify and reduce bias (e.g., re-weighting the data, altering the algorithms' objectives to promote fairness, or using techniques like adversarial de-biasing).

Algorithmic Transparency

Firms and providers should develop and use AI systems that can explain their decisions and the “thought” process behind them. This transparency can help identify when and how biases might influence outcomes. Where possible, providers and developers could make the algorithms accessible for audit and review by external parties, which could enhance accountability and facilitate independent checks for bias.

Ongoing Monitoring and Evaluation

Providers and developers should regularly monitor AI systems to ensure they continue to operate fairly as they evolve over time. Law firms using AI should be aware of the potential for biased results and intervene when

appropriate. Providers and developers should likewise implement feedback mechanisms to collect feedback from users about potential biases, using this information to continuously improve the AI system.

Stakeholder Engagement

AI providers and developers, as well as firms should include team members from diverse backgrounds to provide multiple perspectives on potential biases.

By implementing these strategies, organizations can better address and reduce the biases inherent in AI systems, leading to fairer and more equitable outcomes. As Amy Webb's practical experiment demonstrates, neglecting issues such as historical bias or injustice in AI training datasets can result in sub-optimal results that may conflict with law firms' internal policies aimed at promoting diversity and comprehensive representation, as well as the broader legal profession's commitment to these principles.

9 Managerial & Human Resources Decisions: Law Firms Should Use AI in Management and Human Resources Contexts in Good Faith and in Accordance with Applicable Regulations

To conclude our discussion on what principles should govern the use of AI in law firms, let us consider a topic that has not yet been widely discussed in this context – the use of AI in management and human resources.

According to Harvard Business Review, “AI will help humans do better human work, namely by helping us improve our emotional intelligence, soft skills, and interpersonal communication skills.”⁷⁹ Emotional intelligence (or EQ) is “a type of social intelligence that involves the ability to monitor one’s own and others’ emotions, to discriminate among them, and to use this information to guide one’s thinking and actions.”⁸⁰

I would argue that EQ is incredibly important (and currently lacking) in many law firm environments. AI has the potential of improving the situation. By adding an EQ component to AI, we enter the realm of “affective computing” – a multidisciplinary field that studies how computers “can recognize, interpret, process, and simulate human affects – it is an inter-

disciplinary field spanning computer science, psychology, and cognitive science.”⁸¹ Affective computing-based AI is already used in different sectors such as customer service,⁸² (including healthcare, insurance and financial services),⁸³ education⁸⁴ and entertainment and gaming.⁸⁵ Affective computing is not without its challenges and ethical problems – the accurate interpretation of nuanced and subjective human emotions across diverse contexts and cultures, as well as ethical concerns related to privacy, consent, and the potential misuse of emotional data.

The EU AI Act could severely limit or altogether prohibit the use of affective AI in relevant jurisdictions – Article 5(1)(f) prohibits “the placing on the market, the putting into service for this specific purpose, or the use of AI systems to infer emotions of a natural person in the areas of workplace and education institutions”, except for medical or safety reasons.⁸⁶ The use of other types of AI in the workplace could likewise be highly restricted if the AI in question qualifies as high-risk pursuant to Article 6 of the EU AI Act.⁸⁷ In addition to requiring workplaces that use high-risk AI systems to ensure trained human oversight, monitoring, record keeping and transparency, Article 26(7) explicitly requires employers to inform workers that they will be subject to the use of a high-risk AI system before deploying it.⁸⁸

A detailed analysis of the use of affective AI in the workplace is beyond the scope of the present chapter but let us consider some of the two most evident internal ways in which legal organizations could use affective AI: in management and hiring decisions.

Law firms could leverage affective AI in management through innovative approaches that focus on enhancing employee engagement, well-being, and as a result, productivity. By using affective computing tools, firms could monitor the emotional well-being of their employees in real-time, allowing for early identification of stress or burnout. This would enable management to offer targeted support, adjust workloads, or provide resources for mental health, leading to a healthier work environment. Affective emotional intelligence could also be integrated into training programs to develop soft skills among lawyers and staff, such as improving negotiation, client interaction, and teamwork skills through feedback on emotional responses during mock sessions. In situations of internal conflict or disagreement, affective AI could provide objective data on partici-

pants' emotional states to guide mediation processes, ensuring resolutions address underlying emotional concerns. Emotion recognition AI already exists, albeit not in a legal context. For example, tech company Affectiva uses AI to analyze human emotions by interpreting facial expressions, vocal tones, and physiological responses.⁸⁹ It is currently used in market research and advertising, i.e., in ad and entertainment content testing, as well as other fields.⁹⁰

Management could use insights from affective computing to provide personalized feedback to employees, tailored to encourage positive behaviors and address areas of stress or challenge. Furthermore, insights from affective emotional intelligence can help law firms build stronger, more cohesive teams by understanding the emotional undercurrents within teams, making informed decisions about team composition, leadership styles, and conflict management strategies. Affective AI can also augment decision-making processes by providing an additional layer of emotional data, helping to understand how decisions might impact employee morale or client satisfaction, leading to more informed and empathetic choices. Implementing these strategies requires careful consideration of privacy, consent, and ethical use of emotional data.

The use of affective AI in a law firm context would in all likelihood interfere with the privacy of lawyers and staff working at the firm, and it is at present difficult to imagine that lawyers would consent to continuous emotional monitoring, especially considering that law firms are not known for the best of working environments.⁹¹ Firms could abuse emotional monitoring and use the collected data against attorneys working there, so in-depth use of affective AI in law firms may be a discussion for another day. But let us see how currently widely available AI could (or couldn't) help human resources-related situations in firms.

A few years ago, someone told me a story about a male junior partner at a large firm whose wife had a particularly difficult delivery. She was hospitalized and in critical condition in one hospital, while the baby was in critical but stable condition in another. This unfortunate situation resulted in the junior partner not being able to work his usual hours and lead to the senior partnership having concerns about his ability to handle his cases.

To test whether and how AI could have been useful in this particular situation, I asked ChatGPT-4 how it would handle this situation as a senior partner.⁹²

ChatGPT-4 replied as follows:

“In a situation as sensitive as this, it’s crucial to approach the conversation with empathy and understanding, recognizing the immense personal strain the junior partner is under. Your role as a senior partner involves balancing the firm’s needs with support for your team members during their personal crises. Here’s a suggested approach for the conversation:

Initial Acknowledgement and Empathy

‘Firstly, I want to express my deepest concern and support for what you’re going through right now. I cannot begin to imagine the stress and worry you must be feeling with your wife and newborn in the hospital. Your family’s health and well-being are the most important things at this moment.’

Expressing Concern

‘I’ve noticed that you’ve been understandably stretched between your commitments to your family and work. It’s clear that managing both in these exceptionally challenging times is not sustainable, and it’s important to us that you take the time you need to be with your family.’

Offering Support and Solutions

‘We value you greatly, not just as a junior partner but as a member of our firm’s family. I want to discuss how we can best support you during this period. We can explore flexible working arrangements, delegate some of your current responsibilities to others in the team, or even discuss taking some extended leave.’

Encouraging Open Communication

‘Please let us know how you’re feeling and what you need from us. It’s crucial that we maintain open lines of communication,

so we can adjust support as your situation changes. We're here to support you, and we want to make sure that you don't feel pressured to return to your usual pace of work until you're ready.'

Reiterating Support

'Your health and your family's health are the priority right now. Please take the time you need, and know that we are here to support you in any way we can. Let's keep in touch about how things are going and how we can assist.'

This approach underscores empathy, support, and flexibility, acknowledging the junior partner's current inability to fully engage with work due to his critical personal situation. It also emphasizes the importance of open communication, allowing for adjustments based on the evolving needs of the junior partner and his family."

In reality, two weeks into his predicament, the junior partner was summoned to a partnership meeting and asked to confirm "his commitment to the firm". A response lacking in emotional intelligence in more ways than one.

As for hiring and promotion decisions, AI could potentially be a double-edged sword. On the one hand, AI offers the promise of reducing human bias and increasing efficiency in the recruitment and promotion processes. By analyzing vast amounts of data and identifying patterns or competencies linked to success in specific roles, AI could help law firms make more objective decisions. AI technology could streamline the screening process, identify candidates with the desired skill sets and potential for growth, and ensure a diverse pool of candidates is considered.

On the other hand, the use of AI in these processes raises significant ethical concerns and challenges. One of the main issues is that AI systems are only as unbiased as the data they are trained on ("garbage in, garbage out", as discussed in Principle 8). If historical data reflects past biases or inequalities, there is a risk that AI could perpetuate or even exacerbate these issues, rather than eliminate them. This is particularly relevant in

law firms, where diversity and inclusion are major industry concerns.⁹³ Moreover, relying solely on AI for hiring and promotion decisions could overlook the nuanced understanding of a candidate's soft skills, such as empathy, judgment, and the ability to build relationships – qualities that are paramount in the legal profession but may not be easily quantifiable by AI algorithms.

Conclusions

The currently widely available AI is the worst it will ever be – as technology continues to advance and improve, more law firms will inevitably incorporate AI into their activities to save time, reduce costs and bolster efficiency. As AI adoption increases across the legal sector, more challenges – and hopefully, solutions – will emerge. While we are still at the inception of AI use by law firms, it seems logical that firms proactive in learning about and utilizing these technologies will have an advantage in the future. As stated in the introduction, the above good governance principles are not a rigid roadmap, but rather a starting point for a conversation about how law firms use AI. Many of the proposed principles overlap, and it is for each firm to decide what points they wish (and feel able) to put an emphasis on.

Beyond adopting their own AI good governance principles, how can firms put them into practice?

While it may not be feasible for every organization, law firms should strive to establish a partner or other senior stakeholder-led department responsible for the use of AI within the firm. This department would oversee the deployment, management, and evaluation of AI technologies to ensure they meet the required standards of transparency and explainability. Additionally, this leadership will be crucial in aligning AI use with the strategic goals of the firm and ensuring adherence to legal and ethical standards. A partner-led approach ensures that senior members of the firm are directly involved in key decisions regarding AI, reinforcing the importance of ethical AI use and aligning it with the firm's values and ethical commitments. This department should also oversee the ongoing education and training for legal professionals within the firm to help them

understand and effectively leverage AI tools in their practice. Some firms are already taking this route: for example, A&O Shearman has a LegalTech Executive Director position. This director “heads [A&O Shearman’s] LegalTech team and provides strategic and operational leadership within the firm [and] is responsible for implementing technology solutions”.⁹⁴ Not every firm will need a fully-fledged AI position or department, however, it would be wise to establish at least some sort of tech-centered internal structure.

Whatever approach any particular law firm decides to adopt with respect to AI, it is good to remember another quote from Isaac Asimov regarding his Three Laws of Robotics: “[t]he Laws apply, as a matter of course, to every tool that human beings use” and can be summed up as “safety”, “effectiveness” and “durability.”⁹⁵

Notes

- 1 Asimov, Isaac. “Runaround” in *I, Robot* (The Isaac Asimov Collection ed.) New York City: Doubleday (1950) p. 40.
- 2 See, e.g. “How to worry wisely about artificial intelligence” *The Economist* (20 April 2023) <https://www.economist.com/leaders/2023/04/20/how-to-worry-wisely-about-artificial-intelligence>.
- 3 “Pause Giant AI Experiments: An Open Letter” *Future of Life Institute* (22 March 2023) <https://futureoflife.org/open-letter/pause-giant-ai-experiments/>.
- 4 *Ibid.*
- 5 *Ibid.*
- 6 *Ibid.*
- 7 Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act) (Text with EEA relevance), PE/24/2024/REV/1 (hereafter EU AI Act).
- 8 EU AI Act, Article 5: Prohibited AI practices.
- 9 EU AI Act, Article 6: Classification rules for high-risk AI systems, paragraphs (1),(2) and the last subparagraph of (3), and Annex III.
- 10 EU AI Act, Article 6: Classification rules for high-risk AI systems, paragraph (3).
- 11 For a user-friendly exploration of the EU AI Act, see the Future of Life (FLI) website on the EU AI Act by Risot U UK (EU Research Lead at FLI), Annemieke Brouwer (EU Policy Research Fellow at FLI) and Taylor Jones (Design and Web Manager at FLI), <https://artificialintelligenceact.eu/>.
- 12 EU AI Act, Article 2: Scope, paragraph (1).

- 13 EU AI Act, Article 99: Penalties.
- 14 United Nations General Assembly (UNGA), Resolution on Seizing the opportunities of safe, secure and trustworthy artificial intelligence systems for sustainable development, 1 April 2024, UN Doc A/RES/78/265.
- 15 OECD, Recommendation of the Council on Artificial Intelligence, OECD/LEGAL/0449, <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449>. For a user-friendly overview of the OECD AI Principles, see OECD.AI, OECD AI Principles Overview, <https://oecd.ai/en/ai-principles>.
- 16 Asilomar AI Principles, *Digital Democracy Calmatters*, ACR 215: 23, https://digitaldemocracy.calmatters.org/bills/ca_20172018oacr215.
- 17 Google AI, Our Principles, <https://AI.google/responsibility/principles/>.
- 18 Microsoft Responsible AI Standard, v2, June 2022, <https://www.microsoft.com/en-us/AI/principles-and-approach>.
- 19 See Report to ABA Resolution No. 112, 13 December 2019, Section II(B),
- 20 See Harvey Website, <https://www.harvey.ai/> and OpenAI, Harvey, <https://openai.com/index/harvey/>.
- 21 Jus Mundi Help Center, “Jus AI Assistant – Alpha Program” <https://help.jus-mundi.com/en/articles/8926887-jus-AI-assistant-alpha-program>.
- 22 ABA Resolution No. 112, 13 December 2019.
- 23 International Bar Association, Artificial Intelligence Working Group of the IBA Alternative and New Law Business Structures (ANLBS) Committee, “Guidelines and Regulations to Provide Insights on Public Policies to Ensure AI’s Beneficial Use as a Professional Tool” (18 September 2024) https://www.ibanet.org/PPID/Constituent/Multi-disply_Pract/anlbs-AI-report.
- 24 The General Council of the Bar, Considerations when using ChatGPT and generative artificial intelligence software based on large language models (30 January 2024) <https://www.barcouncilethics.co.uk/documents/considerations-when-using-chatgpt-and-generative-AI-software-based-on-large-language-models/>.
- 25 See Legal Services Board, “Guidance on promoting technology and innovation to improve access to legal services” (23 April 2024) and “Email from the Legal Services Board to the Secretary of State for Science, Innovation and Technology and the Lord Chancellor and Secretary of State for Justice, outlining the Legal Services Board’s pro-innovation approach to AI regulation” (29 April 2024) both available at <https://legalservicesboard.org.uk/news/lsb-publishes-update-on-approach-to-regulating-AI-use>.
 Issued in response to a ministerial request from the UK’s Department of Science, Innovation and Technology and the Ministry of Justice, see “Letter from DSIT and MoJ Secretaries of State to the Legal Services Board” (15 February 2024) <https://www.gov.uk/government/publications/request-for-regulators-to-publish-an-update-on-their-strategic-approach-to-AI-secretary-of-state-letters/letter-from-dsit-and-moj-secretaries-of-state-to-the-legal-services-board-html>.
- 26 The State Bar of California “Standing Committee on Professional Responsibility and Conduct, Practical Guidance for the Use of Generative Artificial Intelligence in the Practice of Law” (16 November 2023) <https://www.calbar.ca.gov/Attorneys/Conduct-Discipline/Ethics/Ethics-Technology-Resources>.

- 27 Silicon Valley Arbitration & Mediation Center, Guidelines on the Use of Artificial Intelligence in Arbitration, 1st edition (2024) <https://svamc.org/svamc-publishes-guidelines-on-the-use-of-artificial-intelligence-in-arbitration/>.
- 28 Note that consumer protection and IP laws may likewise play an important role in a law firm's use of AI.
- 29 See, e.g., American Bar Association, Model Rules of Professional Conduct, Rule 1.6.
- 30 See e.g., Cerny, J., Delchin, S. & Nguyen, H., *Legal Ethics in the Use of Artificial Intelligence* (February 2019). <https://www.squirepattonboggs.com/en/insights/publications/2019/02/legal-ethics-in-the-use-of-artificial-intelligence> p. 4 (hereafter Cerny, Delchin & Others).
- 31 Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (hereafter GDPR).
- 32 It is interesting to note that Allen & Overy, a firm that has been a proponent of AI use, has associated itself with Aosphere, a UK-registered limited liability company that provides "online legal risk management products", including analysis of global data privacy laws. <https://www.aosphere.com/aos/Home>.
- 33 GDPR, Article 5(a)
- 34 GDPR, Article 5(b).
- 35 GDPR, Article 5(c).
- 36 GDPR, Article 5(d).
- 37 E.g., Australia, Brazil, Canada, Chile, China, Egypt, India, Israel, Japan, New Zealand, Nigeria, South Africa, South Korea, Switzerland, Thailand, Turkey, and some US States. For a broad overview of the data privacy laws in these jurisdictions, see Simmons, Dan. "17 Countries with GDPR-like Data Privacy Laws" *Comforte* (13 January 2022) <https://insights.comforte.com/countries-with-GDPR-like-data-privacy-laws>; Woodward, M. "16 Countries with GDPR-like Data Privacy Laws" *Security Scorecard* (8 July 2021) <https://securityscorecard.com/blog/countries-with-GDPR-like-data-privacy-laws/>.
- 38 American Bar Association, Model Rules of Professional Conduct, Rule 1.6 (a) & (b).
- 39 American Bar Association, Model Rules of Professional Conduct, Rule 1.6 (c).
- 40 See, e.g., Bousquette, Isabelle. "Companies Will Use Generative AI. But Will They Tell You About It?" *Wall Street Journal* (31 August 2023) <https://www.wsj.com/articles/companies-will-use-generative-AI-but-will-they-tell-you-about-it-a4cab6b9>.
- 41 See, e.g., Gottlieb, Isabel. "Law Firms Wrestle With How Much to Tell Clients About AI Use" *Bloomberg Law* (29 November 2023) <https://news.bloomberglaw.com/business-and-practice/law-firms-wrestle-with-how-much-to-tell-clients-about-AI-use>.
- 42 *Ibid.*
- 43 See, e.g., American Bar Association, Model Rules of Professional Conduct, Rules 1.4: Communications: Client-Lawyer Relationship. For a comparison of how different US States have adopted or incorporated Model Rule 1.4, see

- American Bar Association, Jurisdictional Rules and Comparison Charts, https://www.americanbar.org/groups/professional_responsibility/policy/rule_charts/.
- 44 The State Bar of California Standing Committee on Professional Responsibility and Conduct, Practical Guidance for the Use of Generative Artificial Intelligence in the Practice of Law.
 - 45 GDPR, *e.g.*, Articles 6(1)(a) and 7.
 - 46 For a discussion on such a scenario, *see* Linna Jr., Daniel W. & Muchman, Wendy J. “Ethical Obligations to Protect Client Data when Building Artificial Intelligence Tools: Wigmore Meets AI” *The Professional Lawyer* (2 October 2020) https://www.americanbar.org/groups/professional_responsibility/publications/professional_lawyer/27/1/ethical-obligations-protect-client-data-when-building-artificial-intelligence-tools-wigmore-meets-AI/#8.
 - 47 *See, e.g.*, Clifford Chance LLP website, “About Us” https://www.cliffordchance.com/about_us/who-we-are-and-how-we-work/policies/AI-Principles.html.
 - 48 For example, the use of generative AI is included in Paul, Weiss, Rifkind, Wharton & Garrison LLP’s standard engagement letter as explained to Bloomberg Law. *See* Gottlieb, Isabel. “Law Firms Wrestle With How Much to Tell Clients About AI Use” *Bloomberg Law* (29 November 2023) <https://news.bloomberglaw.com/business-and-practice/law-firms-wrestle-with-how-much-to-tell-clients-about-ai-use>.
 - 49 Exceptions could be made for tasks that do not involve judgment, *e.g.*, manual tasks such as filing and naming documents, or other tasks that could be accomplished by paralegals or secretaries and do not directly relate to the practice of law.
 - 50 American Bar Association, Model Rules of Professional Conduct, Rule 5.3, *see also* Rule 5.1. *See also* Cerny, Delchin & Others pp. 4-5.
 - 51 Kennedys Law LLP, *Professional liability report 2023: trends and future risks* p. 9, <https://kennedyslaw.com/en/thought-leadership/reports/2023/professional-liability-report-2023-trends-and-future-risks/>.
 - 52 *Ibid.*
 - 53 Different mechanisms may be employed:
 - * Human-in-the-Loop (“HITL”): this approach involves human intervention in the AI decision-making process, where humans are needed to approve or modify AI suggestions before final outcomes are determined.
 - * Human-on-the-Loop (“HOTL”): in this model, AI systems mostly operate independently, but humans monitor and can intervene in the process if the AI’s actions deviate from expected or desired outcomes.
 - * Human-in-Command (“HIC”): this principle ensures that, regardless of AI autonomy, humans have ultimate control over the AI system, including the ability to deactivate or override the system if necessary. This is the approach favored by the European Economic and Social Committee.
- See* Fischer, Joel E., Greenhalgh, Chris, Jiang, Wenchao, Ramchurn, Sarvapali D., Wu, Feng & Rodden, Tom, “In-the-loop or on-the-loop? Interactional arrangements to support team coordination with a planning agent” *Concurrency and Computation: Practice and Experience* Special Issue: 2018, Vol. 33, Issue 8, <https://onlinelibrary.wiley.com/doi/full/10.1002/cpe.4082>; Wang, Ge.

“Humans in the Loop: The Design of Interactive AI Systems” *Stanford University* (20 October 2019) <https://hai.stanford.edu/news/humans-loop-design-interactive-ai-systems>; “Artificial Intelligence: Europe needs to take a human-in-command approach, says EESC” *European Economic and Social Committee* Press Release No. 27/2017 (31 May 2017) <https://www.eesc.europa.eu/en/news-media/press-releases/artificial-intelligence-europe-needs-take-human-command-approach-says-eesc#downloads>. See also EU AI Act, Article 14: Human oversight.

- 54 At present, law firms are much more likely to use AI developed by a third party, as opposed to developing their own AI programs.
- 55 Rosenberg, Carolyn H. & Cummings, David M. “Let’s “chat” about A.I. and insurance” *Reuters* (24 October 2023) <https://www.reuters.com/legal/legalindustry/lets-chat-about-AI-insurance-2023-10-24/>.
- 56 See discussion in Siva Kumar, Ram Shankar & Nagle, Frank. “The Case for AI Insurance” *Harvard Business Review* (29 April 2020) <https://hbr.org/2020/04/the-case-for-ai-insurance>.
- 57 American Bar Association, Model Rules of Professional Conduct, Rule 1.1: Competence. See also EU AI Act, Article 4: AI literacy.
- 58 American Bar Association, Model Rules of Professional Conduct, Comment to Rule 1.1: Competence. See also Cerny, Delchin & Others p. 4; Hedda Litwin, The Ethical Duty of Technology Competence: What Does it Mean for You?, National Association of Attorneys General, <https://www.naag.org/attorney-general-journal/the-ethical-duty-of-technology-competence-what-does-it-mean-for-you/>.
- 59 Litwin, Hedda. “The Ethical Duty of Technology Competence: What Does it Mean for You?” *National Association of Attorneys General* <https://www.naag.org/attorney-general-journal/the-ethical-duty-of-technology-competence-what-does-it-mean-for-you/>. According to Litwin, who is the Former Cyberspace Law Chief Counsel and NAGTRI Program Counsel National Association of Attorneys General, in 2017, twenty-eight states had “adopted the amendment verbatim, while other states have adopted a modified, and in some cases, less stringent version”.
- 60 These jurisdictions are: Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming (see American Bar Association, Jurisdictional Rules and Comparison Charts, https://www.americanbar.org/groups/professional_responsibility/policy/rule_charts/).
- 61 *E.g.*, Florida and North Carolina. Since 1 July 2023, newly admitted New York attorneys must complete at least one CLE hour in Cybersecurity, Privacy and Data Protection.
See Southern University Law Center, State by State CLE Credits Requirements, <https://www.sulc.edu/page/5104>; New York State Bar Association, New York CLE Requirements,

- <https://nysba.org/new-york-cle-requirements/>; Ambrogio, Robert. “Florida Becomes First State To Mandate Tech CLE” *LawSites* (3 October 2016) <https://www.lawnext.com/2016/10/florida-becomes-first-state-mandate-tech-cle.html>; Ambrogio, Robert. “North Carolina Becomes Second State to Mandate Technology Training for Lawyers” *LawSites* (5 December 2018) <https://www.lawnext.com/2018/12/north-carolina-becomes-second-state-mandate-technology-training-lawyers.html>; Ambrogio, Robert. “New York Becomes First State to Mandate CLE in Cybersecurity, Privacy and Data Protection” *LawSites* (4 August 2022) <https://www.lawnext.com/2022/08/new-york-becomes-first-state-to-mandate-cle-in-cybersecurity-privacy-and-data-protection.html>.
- 62 Québec Bar, Code of Professional Conduct of Lawyers, Rule 21, <https://www.legisquebec.gouv.qc.ca/en/document/cr/b-1,%20r.%203.1>; Gril, Emanuelle. “Technologies de l’information : de nouvelles obligations déontologiques” *Barreau du Québec* (15 June 2021) <https://www.barreau.qc.ca/fr/nouvelle/dossier/pratique-droit-ere-nouvelles-technologies/technologies-information-nouvelles-obligations-deontologiques/>.
- 63 UNCITRAL Code of Conduct for Arbitrators in International Investment Dispute Resolution (2024), Article 6(b).
- 64 Commentary to the UNCITRAL Code of Conduct for Arbitrators in International Investment Dispute Resolution (2024), Comment to Article 6, para. 46.
- 65 As evidenced by, for example, by Katia Fach Gómez’s recent comprehensive study on the technological competence of arbitrators. See Fach Gómez, Katia. *The Technological Competence of Arbitrators: A Comparative and International Legal Study* (Springer 2023).
- 66 See e.g., Databricks, *A Compact Guide to Large Language Models*, Sections 1 & 2. <https://www.databricks.com/resources/ebook/tap-full-potential-LLM/>.
- 67 For example, consider ChatGPT 3.5’s different answers to questions about rock climbing in the Netherlands.

Query 1: “Where is the best place to go outdoor rock climbing in the Netherlands?”

ChatGPT 3.5: “One of the popular places for outdoor rock climbing in the Netherlands is in the South Limburg region, particularly around the town of Maas-tricht. There are several limestone quarries in this area that offer climbing opportunities, such as the Cauberg and the Sint Pietersberg.

Additionally, there are some indoor climbing gyms in the Netherlands that offer outdoor climbing excursions and courses, which can be a great option for those looking to explore outdoor climbing in a safe and guided environment.

Keep in mind that outdoor climbing areas may have specific regulations or access requirements, so it’s essential to research and plan your visit accordingly. Additionally, always prioritize safety and consider partnering with experienced climbers or guides if you’re new to outdoor climbing.”

Query 2: “Can one go outdoor rock climbing in the Netherlands?”

ChatGPT 3.5: “Yes, one can go rock climbing in the Netherlands. Despite the country’s flat geography, the Netherlands offers a variety of indoor and some outdoor artificial climbing facilities that cater to climbers of all skill levels. Indoor climbing gyms are widespread, providing opportunities for bouldering, top-rope, and lead climbing. Facilities like Monte Cervino in Bergschenhoek offer an outdoor artificial rock experience, while indoor centers like Klimmuur, Neoliet, and Bjoeks Klimcentrum feature extensive climbing walls and courses. These venues are equipped with routes for both beginners and experienced climbers, making rock climbing a popular and accessible sport throughout the country.” [emphasis added]

The wording of the first query *a priori* assumed that the Netherlands is a place to go rock-climbing, leading to a response that did put emphasis on the country’s flat terrain, while the second prompt was not embedded with such an assumption, leading to a more helpful answer.

Note that I used ChatGPT 3.5, not ChatGPT 4 to demonstrate this point – the latter, more advanced program of the AI, has had more extensive training, making its answers to both queries less blatantly different.

- 68 ‘Deepfakes’ are a form of synthetic media, which “use a form of artificial intelligence called deep learning” to create fake images, videos and/or audios, often used to mimic real persons. Deepfake audios are called ‘voice skins’ or ‘voice clones’. See Sample, I. “What Are Deepfakes and How Can You Spot Them?” *The Guardian* (13 January 2020) <https://www.theguardian.com/technology/2020/jan/13/what-are-deepfakes-and-how-can-you-spot-them>; Somers, Meredith. “Deepfakes, explained” *Massachusetts Institute of Technology, Sloan School* (21 July 2020) <https://mitsloan.mit.edu/ideas-made-to-matter/deepfakes-explained>.
- 69 See, e.g., Broger-Bareham, Kitty and Ball, Kieran. “Deepfaked evidence – are lawyers ready?” *The Law Society Gazette* (24 November 2023) <https://www.law-gazette.co.uk/practice-points/deepfaked-evidence-are-lawyers-ready/5118017>. article.
- 70 See, e.g., “Scammers trick firm out of \$26 million by impersonating senior executives using deepfakes” *The Journal* (4 February 2024) <https://www.thejournal.ie/deepfake-scam-hong-kong-6290706-Feb2024/>; Brewster, Thomas. “Fraudsters Cloned Company Director’s Voice In \$35 Million Heist, Police Find” *Forbes* (14 October 2021) <https://www.forbes.com/sites/thomasbrewster/2021/10/14/huge-bank-fraud-uses-deep-fake-voice-tech-to-steal-millions/>; Chen, Heather & Magramo, Kathleen. “Finance worker pays out \$25 million after video call with deepfake ‘chief financial officer’” *CNN* (4 February 2024) <https://edition.cnn.com/2024/02/04/asia/deepfake-cfo-scam-hong-kong-intl-hnk/index.html>.
- 71 If you want to learn more about how to formulate prompts to LLMS, see, e.g., Damji, Jules S. “Best Prompt Techniques for Best LLM Responses” *The Modern Scientist* (12 February 2024) <https://medium.com/the-modern-scientist/best->

- prompt-techniques-for-best-LLM-responses-24d2ff4f6bca; Dhamani, Numa & Engler, Maggie. “Maximizing the Utility of Large Language Models (LLMs) through Prompting” *InfoQ* (19 January 2024) <https://www.infoq.com/articles/large-language-models-LLMs-prompting/>; “LLM Prompting Guide” *Hugging Face* <https://huggingface.co/docs/transformers/main/en/tasks/prompting>; Nguyen, Isabelle. “The Beginner’s Guide to LLM Prompting” *Deepset* (15 June 2023) <https://haystack.deepset.ai/blog/beginners-guide-to-llm-prompting>.
- 72 For a general discussion, see, e.g., Jelly, Simon. “Garbage In, Garbage Out: The Role Of Data Management In Effective AI” *Forbes* (16 November 2023) <https://www.forbes.com/sites/forbesbusinesscouncil/2023/11/16/garbage-in-garbage-out-the-role-of-data-management-in-effective-ai/>. For more detailed discussions see machine learning researcher and engineer Hillary Sanders presentation at 2023 Black Hat USA <https://www.youtube.com/watch?v=7Dd41QDwmLY>.
- 73 See Amy Webb’s presentation at the 2023 sxsw Conference, https://youtu.be/vMUpzxZB3-Y?si=XDz3Ntsf8vK_4AIW&t=3216. See also Webb, Amy. *The Big Nine: How the Tech Titans and Their Thinking Machines Could Warp Humanity* (Hachette USA, 2019).
- 74 See JusConnect, <https://jusconnect.com/en/directory/arbitrators/all>.
- 75 Langford, Malcolm, Behn, Daniel & Liepp, Runar Hilleren. “The Revolving Door in International Investment Arbitration” *Journal of International Economic Law* (2017) pp. 9-10.
- 76 See LinkedIn post regarding an updated version of the Top 25 list by Bordeaux University researcher Jeff Dorce, April 2024, <https://www.linkedin.com/feed/update/urn:li:activity:7184871862525399040/>.
- 77 Amy Webb’s presentation at the 2023 sxsw Conference, https://youtu.be/vMUpzxZB3-Y?si=_Q4-KDGqWVCShid&t=3371.
- 78 See, e.g., Dhaliya, D., Singh Dari, S., Dhaliya, A., Akhila, N., Kachhoriya, R. & Khetani, V. “Addressing Bias in Machine Learning Algorithms: Promoting Fairness and Ethical Design” *E3S Web of Conferences* 491 (February 2024) https://www.researchgate.net/publication/378366879_Addressing_Bias_in_Machine_Learning_Algorithms_Promoting_Fairness_and_Ethical_Design; Chandra, R., Sanjaya, K., Aravind, A.R., Abbas, A.R., Gulr ukh, R. & Kumar, S. “Algorithmic Fairness and Bias in Machine Learning Systems” *E3S Web of Conferences* 399 (July 2023) https://www.researchgate.net/publication/372339319_Algorithmic_Fairness_and_Bias_in_Machine_Learning_Systems.
- 79 <https://hbr.org/2022/01/can-AI-teach-us-how-to-become-more-emotionally-intelligent>.
- 80 Mayer J.D., Salovey P. “The intelligence of emotional intelligence” *Intelligence* 1993;17:432-42.
- 81 Tao, Jianhua & Tan, Tieniu. “Affective Computing: A Review” *Affective Computing and Intelligent Interaction*. Vol. LNCS 3784. Springer (2005) pp. 981-995; Picard, R.W. “Affective Computing” *MIT Media Laboratory, Perceptual Computing Section Technical Report* 321, Revised 26 November 1995; <https://www.datacamp.com/blog/what-is-affective-computing>.

- 82 <https://www.linkedin.com/pulse/humans-more-emotional-intelligence-role-ai-vinayak-singh-shekhawat/>.
- 83 E.g.: Affectiva – a technology company that specializes in emotion measurement software, which uses artificial intelligence to analyze facial expressions and emotions in videos and real-time interactions with customers.
<https://www.affectiva.com/>.
Cogito – a technology company that develops AI software designed to enhance emotional intelligence in phone conversations, offering real-time guidance to improve customer engagement for enterprise clients.
<https://cogitocorp.com/>.
- 84 See Affective Tutoring Systems as discussed in Fwa, Hua Leong. “An architectural design and evaluation of an affective tutoring system for novice programmers” *International Journal of Educational Technology in Higher Education* Volume 15, Article number: 38 (2018).
- 85 E.g., Nevermind – an adventure video game that incorporates biofeedback to adjust its difficulty based on the player’s level of stress and fear, encouraging players to learn stress management techniques.
<https://nevermindgame.com/about>.
- 86 EU AI Act, Article 5: Prohibited AI practices, paragraph (1)(f), Annex III, paragraphs 1(c), 4.
- 87 EU AI Act, Article 6: Classification rules for high-risk AI systems, paragraphs (1), (2) and the last subparagraph of paragraph (3).
- 88 EU AI Act, Article 26: Obligations of deployers of high-risk AI systems, *see* paragraph (7) specifically regarding the obligation to inform employees.
- 89 See Affectiva website, <https://www.affectiva.com/>.
- 90 See Affectiva website, Solutions, <https://www.affectiva.com/solutions/>.
- 91 See, e.g., Rubino, Kathryn. “Law Firm Life Is Terrible For Your Health” *Above The Law* (24 November 2015) <https://abovethelaw.com/2015/11/law-firm-life-is-terrible-for-your-health/>; Edwards, Ben. “Undervalued lawyers more likely to suffer well-being issues, study finds” *Global Legal Post* (7 June 2022) <https://www.globallegalpost.com/news/undervalued-lawyers-more-likely-to-suffer-well-being-issues-study-finds-410901776>; Patrice, Joe. “You Didn’t See Your Kids Before The Pandemic, You Shouldn’t Expect To See Them Now,’ Says Elite Law Firm Partner” *Above The Law* (25 May 2023) <https://abovethelaw.com/2023/05/you-didnt-see-your-kids-before-the-pandemic-you-shouldnt-expect-to-see-them-now-says-elite-law-firm-partner/>; Mawardi, Adam & Burton, Lucy. “The City lawyers working themselves to death” *The Telegraph* (10 March 2024) <https://www.telegraph.co.uk/business/2024/03/10/city-of-london-lawyers-working-themselves-to-death/>.
- 92 The exact prompt to ChatGPT 4 was as follows:

“Imagine that you are a senior partner at a large international law firm. A male junior partner on your team just welcomed a baby. His wife had serious complications during the delivery, and both her and the baby remain in hospital. His wife is in critical condition in one hospital, while the baby is in critical but stable condition in another hospital. During the past few weeks, the junior partner has been going from one hospital to the other to visit his wife and new

baby. As a result of this, the junior partner has not been as present at work as usual. You are concerned about the junior partner neglecting his work because of this situation. What do you say to him?"

- 93 Axelrod, Sheryl L. "The Underrepresentation of Women at the Highest Levels of the Legal Profession" *Law Practice Today* (5 October 2022) <https://www.lawpracticetoday.org/article/despite-all-the-profession-has-to-gain-from-our-greater-inclusion-the-under-representation-of-women-at-the-highest-levels-of-the-legal-profession/>; Zaretsky, Staci. "The 2023 Biglaw Diversity Scorecard: More Progress Amid A War On DEI" *Above The Law* (31 May 2023) <https://abovethelaw.com/2023/05/biglaw-diversity-scorecard/>; Roe, Dan. "Diversity Improving at Law Firms, but Forces Are Working Against Those Efforts" *Law.com* (31 May 2023) <https://www.law.com/americanlawyer/2023/05/31/diversity-improving-at-law-firms-but-forces-are-working-against-those-efforts/>; Monnay, Tatyana. "Affirmative Action's Demise Threatens Big Law Diversity Pipeline" *Bloomberg Law* (30 June 2023) <https://news.bloomberglaw.com/business-and-practice/affirmative-actions-demise-threatens-big-law-diversity-pipeline/>; Packel, Dan. "The Law Firm Disrupted: A Fresh Take on Big Law's Diversity Problem" *Law.com* (25 January 2024) <https://www.law.com/2024/01/25/the-law-firm-disrupted-a-fresh-take-on-big-laws-diversity-problem/>, discussing book by sociologist and former Wilmer associate Kevin Woodson, see Woodson, Kevin. *The Black Ceiling: How Race Still Matters in the Elite Workplace* (University of Chicago Press 2023).
- 94 A&O Shearman Website, Profile of Kevin Oliver, <https://www.aoshearman.com/en/people/kevin-oliver>.
- 95 Asimov, Isaac. "The Three Laws" *Compute!* (November 1981) p. 18, <https://archive.org/details/1981-11-compute-magazine/page/18/mode/2up?view=theater>.