

Review

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Addressing the challenges of harmonizing law and artificial intelligence technology in modern society¹

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Law evolves in response to new economic realities introduced by technology, rather than technology altering the law itself.

Judge Curtis Karnow²

What challenges exist in harmonizing law and AI?

The article identifies challenges in harmonizing law and AI, including:

1. **Privacy and Data Protection:** AI's reliance on extensive personal data raises privacy concerns and undermines individual data sovereignty. Existing laws like EU's GDPR³ lack specificity for AI, creating legal ambiguities.
2. **Smart Contracts:** AI-powered self-executing contracts challenge enforceability and adherence to traditional legal standards, raising questions about intent, fairness, and adaptability.⁴
3. **Intellectual Property:** Autonomous AI creations blur lines of authorship, originality, and ownership, creating gaps in traditional intellectual property frameworks.

¹ Seremeti et al., Addressing the challenges of harmonizing law and artificial intelligence technology in modern society. 2025. *IAES International Journal of Artificial Intelligence*. DOI: 10.11591/ijai.v14.i5.pp2471-2478.

² C. Karnow, *Future codes: Essays in advanced computer technology and the law*. Artech House, 1997.

³ General Data Protection Regulation is a comprehensive data protection law enacted by the European Union in May 2018. It governs how personal data of individuals within the EU is collected, processed, stored, and shared. GDPR aims to protect privacy and data rights, giving individuals greater control over their personal information. It applies to organizations worldwide that handle EU residents' data and includes provisions for consent, data minimization, transparency, and accountability. Non-compliance can result in significant fines.

⁴ Cites Carlson, K. W. (2019). Safe artificial general intelligence via distributed ledger technology. *Big Data Cogn. Comput.*, 3(40). doi:10.3390/bdcc3030040.

4. **Liability and Accountability:** AI's autonomous decisions, such as in autonomous vehicles, complicate the allocation of responsibility for harm, as traditional tort laws inadequately address accountability.
5. **AI in Legal Practice:** AI's role in legal analysis and judicial decision-making raises concerns about impartiality, transparency, and procedural fairness due to algorithmic opacity and data bias.

These challenges highlight the need for AI-specific regulations to address privacy, accountability, intellectual property, and liability while preserving fundamental human rights and societal values.

Table 1. Catalysts for the legal shift

Challenge area	Value-principle	Description	Key issues	Legal shift
Privacy and data protection	The general rights of personhood, in its image, honor, and privacy	AI's reliance on extensive personal data raises significant privacy concerns and may undermine individual data sovereignty.	Existing data protection laws (e.g., GDPR) lack specificity for AI, creating legal ambiguities [20], [21].	Calls for AI-specific data privacy regulations to address unique AI data processing methods [22], [23].
Smart contracts	The principle of contractual autonomy	Self-executing AI-powered contracts automate transaction enforcement [24], presenting challenges in enforceability and adherence to traditional legal standards.	Questions arise over intent, fairness, and adaptability within traditional contract law.	Necessitates new standards for validating and enforcing AI-powered legal contracts [25].
Intellectual property	General principles of intellectual property (IP) law	Autonomous AI creation challenges traditional IP frameworks by blurring lines of authorship, originality, and ownership rights [26].	IP laws attribute rights to natural persons, creating ownership issues for AI-generated outputs.	Drives redefinition of IP laws to address AI's role in creation and authorship [27].
Liability and accountability	Principles of tort liability	Autonomous decisions by AI, particularly in fields like autonomous vehicles, complicate the allocation of responsibility for harm [28], [29].	Traditional tort laws inadequately address accountability in cases of AI-caused harm.	Pushes for AI-specific liability frameworks to clarify accountability [30].
AI in legal practice	The principle of the "abuse of rights"	AI's role in legal analysis and potentially judicial decision-making raises concerns about impartiality, transparency, and procedural fairness [31].	Algorithmic opacity and data bias may compromise core legal rights, such as a fair trial.	Advocates for regulatory oversight on AI use in judicial and legal processes to preserve fairness [32].

Addressing the challenges of harmonizing law and artificial intelligence technology ... (Lamprini Seremeti)

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Explain the need for AI-specific liability frameworks.

Seremeti et al. emphasize the need for AI-specific liability frameworks due to the complexities introduced by AI's autonomous decision-making. Traditional tort laws are inadequate to address accountability in cases where harm is caused by AI systems, such as autonomous vehicles or other high-stakes applications. Key reasons for this need include:

1. **Autonomous Actions:** AI systems often operate independently, making it difficult to pinpoint responsibility for harm. Liability could involve multiple parties, such as manufacturers, programmers, or users.
2. **Multiplicity of Factors:** AI behavior is influenced by algorithms, data inputs, and operational models, complicating the determination of fault.
3. **Legal Ambiguities:** Existing liability rules do not fully account for the unique attributes of AI, such as its unpredictability and evolving capabilities.
4. **Public Trust:** Clear liability frameworks are essential to maintain public trust and accountability in AI-driven systems.

The authors advocate proactive legal reform to create AI-specific liability frameworks that clarify accountability, ensure fairness, and preserve societal values amidst AI's transformative impact.

What principles of tort liability are affected by AI?

AI affects the principles of tort liability in several ways:

1. **Accountability:** AI's autonomous decisions complicate the allocation of responsibility for harm, making it unclear who should be held liable—whether it is the manufacturer, programmer, or user.
2. **Causation:** Determining the cause of harm becomes challenging due to the complexity of AI systems, which involve algorithms, data inputs, and operational models.
3. **Foreseeability:** AI's unpredictable behavior can make it difficult to assess whether harm was foreseeable, a key element in tort liability.
4. **Standard of Care:** The application of traditional standards of care may not align with the unique capabilities and limitations of AI systems.

These disruptions necessitate the development of AI-specific liability frameworks to address these challenges and ensure accountability in cases of harm caused by AI systems.

Please list the historical analogies cited by the authors.

The authors cite the following historical analogies to describe the legal shifts necessitated by technological advancements, particularly AI:

Coups and Revolutions: The authors compare AI's legal disruption to historic societal shifts such as coups, revolutions, and other radical changes. These events often led to substantial re-evaluations of laws and governance structures.

Military Coups: Military coups are referenced as abrupt transitions in governance and societal norms, which carry significant legal implications. Unlike military coups characterized by overt force, AI's impact is described as a subtler but equally profound shift.

Internal Reformation: AI-induced changes are likened to internal legal reformations rather than complete overthrows of legal principles, emphasizing the need for adaptation rather than replacement.

These analogies are used to highlight the urgency of establishing responsive and adaptive legal frameworks to address the transformative impact of AI.

What are the main criticisms of the article?

Apologies for the confusion earlier! Here's the critique translated into English:

The article titled "Addressing the challenges of harmonizing law and artificial intelligence technology in modern society" provides an in-depth analysis of the legal challenges posed by integrating artificial intelligence (AI) into traditional legal systems. Here are its main limitations:

1. **Lack of Empirical Data:** While the article is based on bibliographic research, it lacks empirical data to validate the hypotheses and models proposed. This limits the practical applicability of its conclusions.
2. **Complexity of Category Theory:** Applying category theory to law and AI may be difficult for readers unfamiliar with mathematics or logic. Simplifying or explaining this approach in layman's terms would have been beneficial.
3. **Absence of Practical Examples:** The article would have been more impactful if it included concrete examples or case studies illustrating the application of category theory in real-world legal scenarios involving AI.
4. **Limited Scope of Recommendations:** Although the article proposes legal adjustments, it does not provide a clear roadmap for implementing these recommendations across different national or international contexts.
5. **Lack of Global Consensus:** The article acknowledges the absence of a global consensus on AI regulation but does not propose solutions to overcome this challenge.

Conclusion:

The article is a valuable contribution to the discussion on integrating AI into legal systems, presenting innovative concepts and interesting theoretical approaches. However, it would benefit from empirical data, practical examples, and simplification of complex concepts.

The authors could also explore the practical implications of their proposals for policymakers and legal practitioners.