

Contractual Liability for AI-Generated Damages in Autonomous Decision-Making Systems

المسؤولية العقدية عن الأضرار التي يُحدثها الذكاء الاصطناعي ضمن أنظمة اتخاذ القرار الذاتية التشغيل

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Abstract:

Private law is undergoing a significant transformation due to the growing use of artificial intelligence in contractual processes, particularly in negotiation, the formation of intent, and the performance of obligations. AI is no longer merely a tool, but an influential actor that raises complex issues concerning will, consent, and the determination of the moment of contract formation. It also creates challenges for contractual liability, given the multiplicity of potential sources of error, including programming, data, and human oversight. These difficulties are further exacerbated by the use of AI in contract analysis and in assessing the feasibility of breach, thereby complicating the attribution of liability in the event of disputes.

Keywords: Artificial Intelligence; Contractual Liability; Contractual Intent; Efficient Breach; Autonomous Systems.

ملخص:

يشهد القانون الخاص تحولاً بفعل استخدام الذكاء الاصطناعي في التعاقد، خاصة في التفاوض وتكوين الإرادة وتنفيذ الالتزامات. لم يعد الذكاء الاصطناعي مجرد أداة، بل عنصراً مؤثراً يثير إشكالات حول الإرادة والرضا وتحديد لحظة انعقاد العقد. كما يخلق تحديات في المسؤولية العقدية بسبب تعدد مصادر الخطأ بين البرمجة والبيانات والرقابة البشرية، وتزداد هذه الصعوبات مع استخدامه في تحليل العقود وتقدير جدوى الإخلال، مما يعقد تحديد المسؤولية عند النزاع.

الكلمات المفتاحية: الذكاء الاصطناعي؛ المسؤولية العقدية؛ النية التعاقدية؛ الإخلال بالعقد؛ الأنظمة المستقلة.

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Introduction:

Over the past decades, technological developments have profoundly transformed the global legal, economic, and social landscape. The emergence of artificial intelligence (AI), in particular, marks a decisive shift in how decisions are made, services delivered, and contractual relationships structured. Unlike traditional automated tools that merely execute predefined instructions, contemporary AI systems learn, adapt, and make autonomous decisions based on evolving datasets. This transition from deterministic programming to independent machine learning has reshaped the dynamics of private transactions and introduced unprecedented legal questions regarding contractual intent, performance, and liability.

The autonomous capabilities of AI systems create profound challenges for the foundational principles of private law. Classical doctrines of contractual liability, built upon the identifiable conduct of a human actor, the foreseeability of harm, and the traceability of causation, presume that contracting parties exercise rational will and control over their decisions. AI-driven systems disrupt this model. They can generate contractual terms, optimize agreement outcomes, and even initiate performance steps without direct human intervention. This raises the pivotal question of how liability should be allocated when harm results not from human behavior, but from opaque algorithmic processes whose internal logic may be inaccessible even to their developers¹.

The “black-box” nature of many machine-learning models intensifies these concerns. AI-based contract analysis tools increasingly operate through highly complex neural architectures that defy intuitive explanation, resulting in situations where neither the user nor the developer can fully articulate why or how a particular contractual decision was generated. This lack of transparency complicates the identification of fault and disrupts traditional methods for establishing causation, both of which remain core elements of contractual liability in most legal systems².

Compounding the legal uncertainty is the growing integration of AI into contractual negotiation and performance. Intelligent agents are now capable of evaluating market conditions, predicting behavioral patterns, and autonomously proposing or modifying contractual terms. When errors occur whether through biased training data, incorrect inference, or self-generated decision paths, they may lead to financial losses, operational disruption, or violations of contractual obligations. Determining whether such outcomes are attributable to programming negligence, misuse by a contracting party, inadequate supervision, or the autonomous evolution of the AI system itself becomes a central concern for modern private law³.

These developments render traditional contractual doctrines increasingly strained. As private actors integrate AI into core contractual functions whether as the subject-matter of the agreement, as the tool for performance, or as an embedded component of digital platforms, the law must grapple with new forms of risk allocation. The challenge is particularly acute in agreements where the AI system acts as a decision-maker rather than a passive tool. In such contexts, the core elements of contractual liability (fault, damage, and causation) must be reconceptualized to address the diffuse and sometimes unpredictable nature of algorithmic conduct.

This study seeks to examine these emerging challenges by analyzing the doctrinal foundations of contractual liability and assessing their suitability for regulating AI-driven harms, while also considering circumstances in which AI-related damage may give rise to tort liability, particularly where developers, providers, or other actors are not bound by a contractual relationship with the injured party.

It further explores how comparative legal systems, particularly civil law and common law traditions, are adapting (or failing to adapt) to AI-generated risks. By examining the roles AI may play within contractual relationships, this research aims to illuminate the specificities of contractual fault, the evolving concept of contractual intent, the complexities of algorithmic causation, and the potential need for legal reforms that distribute risk fairly among developers, providers, and users of intelligent systems.

Ultimately, the objective is to determine whether existing contractual frameworks can accommodate the realities of autonomous decision-making, or whether new regulatory approaches are required to safeguard contracting parties, promote technological innovation, and maintain legal certainty.

In light of the foregoing, the present study seeks to answer the following central question: To what extent can traditional rules of contractual liability adequately address damages resulting from the operation of artificial intelligence systems? and do the particular characteristics of such systems require a rethinking of existing liability frameworks?.

This central question gives rise to several subsidiary issues. First, it is necessary to determine whether the traditional elements of contractual liability remain adequate in disputes involving artificial intelligence. Second, the study examines how responsibility should be allocated among developers, providers, and users of AI systems. Third, it evaluates whether existing solutions in civil law and common law jurisdictions are capable of addressing AI-related contractual disputes or require further legal adaptation.

To address these questions, the study adopts an analytical approach by examining the legal foundations of contractual liability and their application to AI-related disputes, as well as a comparative approach through the analysis of selected civil law and common law solutions in order to assess their effectiveness in addressing the legal challenges posed by artificial intelligence systems.

The study is based on the assumption that although traditional contractual liability rules remain applicable to certain AI-related disputes, the autonomous and opaque nature of advanced AI systems may require a reconsideration of some conventional concepts of fault and causation in order to ensure effective legal protection.

Section I: General Conditions of Contractual Liability for AI-Generated Damages

Artificial intelligence technologies are increasingly woven into the fabric of contractual relationships, whether as integrated components of complex digital systems, tools for performance, or the very object of the agreement itself. As AI systems evolve toward higher levels of autonomy and adaptive behavior, the classical foundations of contractual liability built on the pillars of obligation, fault, damage, and causation face unprecedented pressure. The analysis is informed, in part, by systematic reviews highlighting the legal and ethical challenges posed by AI-driven decision-making in contractual performance, breach, and risk allocation⁴.

A) Existence of a Valid Contractual Obligation:

Contractual liability presupposes the existence of a legally binding obligation arising from a valid contract. In AI-enhanced transactions, such obligations may relate to:

1. The sale or supply of an AI system,
2. The development or customization of AI-based software,
3. The provision of services dependent on machine-learning models, or
4. The operation of an autonomous system on behalf of another contracting party.

Each of these categories raises specific legal concerns. When the AI system is the object of the agreement, the supplier owes duties analogous to traditional obligations of conformity, fitness for purpose, and the absence of hidden defects. However, AI systems may evolve dynamically, producing outputs that differ significantly from their initial performance characteristics. This complicates the assessment of conformity.

Where AI is used as a means of performance, the contracting party who deploys it remains bound to perform obligations in accordance with the contract. Yet, AI-driven systems introduce variability and uncertainty into performance outcomes, raising the question of whether malfunctions or erroneous decisions should be attributed to the user, the developer, or the algorithm itself ⁵.

Moreover, when AI autonomously generates contractual terms as may occur in automated negotiation platforms, doubts arise regarding the attribution of consent. The objective manifestation of will becomes difficult to assess when outputs are produced by opaque computational processes instead of human deliberation.

B) Contractual Fault and the Problem of Attribution:

Fault is traditionally understood as the failure of a contracting party to perform obligations with due diligence, resulting in a breach. This classical understanding presupposes that the conduct leading to the breach can be traced back to a human actor who exercised control over the contractual process. However, the integration of artificial intelligence systems significantly complicates this analysis. Algorithmic tools may autonomously evaluate risks, propose contractual actions, or even recommend breach strategies based on economic optimization models. In such contexts, the link between human conduct and contractual fault becomes increasingly attenuated, raising complex questions regarding the attribution of responsibility.

Key questions include:

- Whose fault is it when an AI system behaves unpredictably?
- Should liability attach to the user, the developer, or the entity that trained the model⁶?
- Can contractual fault exist in the absence of human intention or negligence?

The difficulty lies not only in identifying the origin of the error, but also in determining the appropriate legal framework for allocating responsibility among multiple actors involved in the lifecycle of the AI system.

From a legal perspective, the nature of liability depends largely on the existence of a contractual relationship between the parties involved. Where damage occurs between parties bound by a contract, liability will generally be governed by the rules of contractual liability. However, where the damage is attributable to developers, software providers, data suppliers, or other actors who are not parties to the contract, the injured party may need to rely on tort liability as the legal basis for compensation. Consequently, AI-related disputes frequently blur the traditional boundary between contractual and tort liability, making it essential to assess carefully the legal status and degree of involvement of each actor in the development, deployment, and operation of the system.

Fault in AI-based contracting can emerge from multiple layers, each reflecting a different stage in the design, deployment, and operation of the system:

•**Design Fault**

Errors embedded in the system's architecture or algorithmic logic may lead to systematically flawed outputs. Such faults often originate during the development phase, where incorrect modeling assumptions, inadequate testing, or flawed coding structures can produce foreseeable yet difficult-to-detect risks. In contractual contexts, this may result in the generation of inappropriate contractual terms or erroneous performance decisions.

•**Data-Related Fault**

Biased, incomplete, or unrepresentative datasets may produce inaccurate or discriminatory outcomes. Since AI systems rely heavily on the quality of training data, any distortion in the data may directly affect contractual decisions, such as risk assessment, pricing, or eligibility criteria. This raises the question of whether responsibility should be attributed to those who curated the data or those who deployed the system without verifying its reliability.

•**Deployment Fault**

Misconfiguration, misuse, or lack of monitoring by users may lead to harmful consequences. Even a well-designed AI system can produce erroneous outcomes if it is improperly integrated into contractual processes or operated without adequate human oversight. This form of fault highlights the continuing importance of human responsibility in supervising and controlling AI-driven tools.

•**Autonomous Decision Fault**

Harms may arise from the system's independent evolution, particularly in machine learning environments where algorithms adapt over time. In such cases, the system may generate decisions that were neither explicitly programmed nor anticipated by its developers. This form of fault challenges the very notion of accountability, as it blurs the line between human responsibility and machine autonomy⁷.

Courts in common law jurisdictions are increasingly confronted with disputes where AI-driven decisions produce harmful outcomes, and where neither human error nor intentional misconduct can be clearly identified. A practical illustration of this issue can be found in *Moffatt v. Air Canada*, where the Civil Resolution Tribunal of British Columbia held Air Canada liable for inaccurate information provided by an AI-powered chatbot on its website. The airline argued that the chatbot should be regarded as a separate entity responsible for its own statements. The Tribunal rejected this argument and confirmed that the company remained responsible for the information communicated through its AI system. This decision highlights the growing judicial tendency to attribute responsibility to the human or corporate actor exercising control over the AI tool rather than to the technology itself, thereby reinforcing the principle of accountability in AI-assisted decision-making⁸.

This growing body of cases reflects the urgent need to rethink traditional concepts of fault in light of distributed and technologically mediated decision-making processes, and to develop more flexible standards capable of addressing the complexities of algorithmic behavior⁹.

C) Contractual Damage in AI-Driven Contexts:

Contractual liability cannot arise without actual damage. This foundational requirement remains unchanged even in technologically advanced environments. However, in the context of artificial

intelligence, the nature, scope, and manifestation of damage become significantly more complex. AI systems, due to their autonomy, scalability, and data-driven functioning, are capable of producing forms of harm that extend beyond traditional contractual expectations.

In AI-driven contractual relations, damage may take diverse and sometimes overlapping forms:

- Direct financial loss, resulting from incorrect predictions, flawed contractual execution, or economically inefficient decisions generated by AI systems.
- Operational harm, including disruptions in business processes, delays in performance, or system malfunctions that affect the continuity and reliability of contractual obligations.
- Legal or regulatory harm, where AI-driven decisions lead to violations of applicable laws or regulatory frameworks, such as compliance failures, unlawful contractual clauses, or breaches of consumer protection rules.
- Relational harm, which affects the trust and long-term cooperation between contracting parties, particularly when AI-generated outcomes undermine expectations of fairness, transparency, or good faith.

AI systems may generate unexpected harms due to their ability to operate at scale and speed. Unlike human actors, whose errors are typically limited in scope, these systems can replicate and amplify a single faulty decision across multiple transactions within a short period.

This amplification effect increases both the intensity and the reach of contractual damage, making its consequences more severe and widespread.

For example, an AI-based contracting tool may inadvertently incorporate discriminatory or anti-competitive clauses derived from biased datasets. Such outcomes not only result in direct financial consequences but may also expose contracting parties to legal liability and reputational damage. Furthermore, AI-enabled “efficient breach” analysis may lead systems to recommend breaches that maximize aggregate efficiency from a purely economic perspective, while disregarding considerations of equity, fairness, and contractual good faith. In such cases, damage cannot be assessed solely in monetary terms, but must also account for broader legal and relational impacts.¹⁰.

D) Causation and the Evidentiary Burden in AI Systems:

Causation is perhaps the most challenging condition of contractual liability in AI-mediated environments. Traditional doctrines rely on linear chains connecting human conduct to harm, assuming that the source of error and its consequences can be clearly traced. AI systems, however, disrupt this classical understanding by introducing highly complex decision pathways that are often non-linear, multi-layered, and opaque. As a result, establishing a direct causal link between a specific action and a resulting harm becomes significantly more difficult.

AI systems disrupt traditional causation by introducing:

- Multiple layers of decision-making, where outputs are influenced by a combination of pre-programmed logic, adaptive learning mechanisms, and stochastic processes. Each layer may contribute differently to the final outcome, making it challenging to identify which stage caused the damage.
- Opaque computational processes, including neural networks and other advanced machine learning architectures, whose internal operations cannot always be intuitively understood or explained even by developers.

- External data sources, where the system incorporates information from third-party databases, sensors, or online inputs, each of which may introduce errors or biases into the final decision.
- Interventions by developers, operators, and third parties, which further complicate the attribution of fault, as multiple actors may influence the behavior of the AI system at different points in its lifecycle.

These multi-source dynamics collectively create what is commonly referred to as “algorithmic opacity,” a situation in which neither the claimant nor the contracting parties can easily trace harm back to a specific fault or actor. This opacity raises profound challenges for traditional evidentiary standards, as conventional proof mechanisms are often inadequate to demonstrate the causal link required for contractual liability¹¹.

From a legal standpoint, the difficulty of proving causation in AI-related disputes raises concerns regarding the effectiveness of traditional contractual liability rules. Requiring the injured party to establish a precise causal link may, in certain circumstances, create an excessive evidentiary burden, particularly where the relevant technical information remains under the control of developers or system operators. Consequently, some scholars argue that strict adherence to conventional causation requirements may undermine effective compensation and legal certainty, thereby justifying the adoption of more flexible evidentiary mechanisms in cases involving complex AI systems.

Because of this complexity, several legal systems-particularly within the European Union-have contemplated innovative measures to address the evidentiary burden:

- Rebuttable presumptions of causation, allowing claimants to rely on certain default assumptions when direct proof is unattainable.
- Reversal of the burden of proof, shifting the responsibility onto the party controlling the AI system to demonstrate that no fault occurred.
- Mandatory data-disclosure obligations, requiring developers or operators to provide access to logs, training data, and decision-making criteria.
- Audit trails and logging requirements, which document the sequence of algorithmic operations to facilitate retrospective analysis.
- Enhanced duties of transparency, compelling developers and users to adopt explainable AI practices that clarify the basis of automated decisions.

Such approaches aim to maintain fairness when victims cannot access or interpret the technical evidence necessary to demonstrate causation, and to ensure that liability is allocated in a manner that reflects both the distributed nature of AI decision-making and the responsibilities of human actors involved. By integrating these mechanisms, legal systems seek to reconcile the opacity inherent in autonomous AI with foundational principles of contractual accountability and evidentiary justice.

Section II: Specificities of Contractual Liability in AI-Enhanced Contracting:

The use of artificial intelligence in contractual relationships creates distinctive challenges regarding intent, fault, damage, and causation. Unlike traditional contracting environments, AI-enhanced contracting involves varying degrees of algorithmic autonomy and distributed decision-making, making the application of traditional liability rules more complex. These characteristics

require a closer examination of how contractual liability operates when contractual outcomes are influenced by intelligent systems.

A) The Challenge of Contractual Intent in AI-Generated Agreements:

Contractual intent traditionally requires a meeting of the minds an expression of will grounded in human cognition and volition. In AI-enhanced contracting, however, outputs such as proposed terms, acceptance signals, or negotiation strategies may be generated autonomously by algorithms. This raises foundational questions:

- Can contractual intent be attributed to a party when the operative decision was made by an algorithmic agent?
- Does reliance on AI undermine the requirement of informed consent?
- How should legal systems treat agreements concluded through algorithmic recommendations or automated decision tools?

AI systems may generate contractual decisions without the user's awareness of the underlying reasoning or data inputs. This disconnect challenges the notion of genuine consent and prompts courts to reconsider whether the objective theory of contract formation suffices in the algorithmic age¹².

B) Multi-Layered Fault and Autonomous Algorithmic Decisions:

Fault in AI-enhanced contracting emerges along multiple vectors, complicating attribution and challenging traditional doctrines centered on human negligence or intentional misconduct. Unlike conventional contractual settings, where fault can generally be linked to a specific human action or omission, AI-driven environments involve distributed decision-making processes in which responsibility is shared across several stages of the system's lifecycle. Algorithmic tools may autonomously assess contractual risk, identify optimal performance pathways, or even calculate the economic desirability of breaching an obligation¹³.

In such contexts, fault becomes fragmented and may no longer be attributable to a single identifiable actor. Distinct forms of algorithmic fault include:

• Algorithmic Misjudgment

Misinterpretation of data inputs or erroneous predictions may lead the system to produce inaccurate or suboptimal contractual decisions. These errors often arise from limitations in the model's design, insufficient training, or the inherent uncertainty of predictive analytics. In contractual settings, such misjudgments may result in inappropriate risk assessments or flawed execution strategies.

• Biased or Defective Data

Training on biased, incomplete, or unrepresentative datasets may generate discriminatory or unreliable outputs. Since AI systems depend heavily on the quality of data, any distortion at this stage can systematically affect contractual decisions, potentially leading to unfair or legally problematic outcomes. This raises important questions regarding the responsibility of those involved in data collection, selection, and validation.

• Fault Through Overreliance

Users relying uncritically on AI recommendations may fail to exercise independent judgment or due diligence. Overreliance on automated outputs can lead to the uncritical acceptance of flawed decisions, thereby increasing the risk of contractual breaches. This form of fault underscores the continuing necessity of human intervention and critical oversight in AI-assisted contracting.

• Fault Through Insufficient Oversight

A lack of human supervision may result in inconsistent, erroneous, or harmful actions generated by the system. Even highly advanced AI tools require monitoring, validation, and periodic review to ensure compliance with contractual obligations. Failure to implement adequate oversight mechanisms may constitute a form of negligence, particularly when foreseeable risks could have been mitigated through proper control measures¹⁴.

This multi-layered fault structure reflects the distributed nature of responsibility in AI-enhanced environments. It demands the development of new analytical frameworks capable of disaggregating liability across developers, suppliers, operators, and end-users, while preserving the fundamental principles of contractual accountability. Such frameworks must balance technological complexity with legal clarity, ensuring that the diffusion of responsibility does not lead to the erosion of liability standards.

C) Algorithmic Causation and Multi-Source Interference:

Causation is profoundly disrupted by the inherent complexity of artificial intelligence systems. Traditional legal reasoning assumes a relatively clear and linear chain of events linking a specific act to a corresponding harm. However, in AI-driven environments, this assumption no longer holds. The chain of events leading to contractual harm becomes fragmented, dynamic, and often non-transparent, making it significantly more difficult to establish a direct causal link.

The process leading to harm may involve multiple interdependent elements, including:

- Training data from unknown or diverse sources, which may introduce hidden biases or inaccuracies that influence the system's outputs without being immediately detectable.
- Algorithmic inference processes not visible to humans, particularly in advanced machine learning models, where the internal reasoning behind decisions cannot be easily explained or reconstructed.
- Real-time adaptation based on environmental inputs, allowing the system to modify its behavior continuously in response to changing conditions, which adds a layer of unpredictability to its actions.
- Multiple stakeholders modifying or interacting with the system, including developers, operators, and external users, each contributing in different ways to the system's evolution and performance.

This combination of factors gives rise to what may be described as “multi-source interference,” where the final outcome is the product of numerous overlapping influences rather than a single identifiable cause. In such circumstances, isolating the precise origin of harm becomes extremely challenging, as causation is distributed across several technical and human components.

This “multi-source interference” challenges traditional causation doctrines, which assume linear, human-driven decision paths. It undermines the applicability of classical tests of causation, such as direct causation or foreseeability, by introducing layers of complexity that obscure the

relationship between conduct and damage. Consequently, legal systems are increasingly required to reconsider how causation is established in AI-mediated contexts, and whether alternative models of attribution or probabilistic reasoning may be necessary to ensure fairness and accountability¹⁵.

D) The Nature of Damage in AI-Driven Contractual Relations:

Artificial intelligence introduces novel categories of contractual damage, many of which are intangible, data-driven, or relational in nature. Unlike traditional forms of contractual harm, which are often limited to direct and quantifiable financial losses, AI-driven damage may extend to more complex and less immediately visible consequences. These emerging forms of harm reflect the increasing integration of AI into decision-making processes and the growing dependence of contractual relationships on algorithmic outputs.

Examples of such damage include:

- Economic losses from miscalculations, where AI systems generate incorrect predictions, pricing errors, or flawed contractual decisions that lead to measurable financial harm.
- Operational disruptions from incorrect scheduling, including delays, interruptions, or inefficiencies in the execution of contractual obligations due to inaccurate automated planning.
- Strategic disadvantages due to asymmetrical AI capabilities, where one contracting party benefits from superior technological tools, thereby creating an imbalance that may affect negotiation power and contractual outcomes.
- Legal or compliance breaches triggered by automated actions, such as the inclusion of unlawful clauses, violations of regulatory requirements, or failures to meet mandatory legal standards.

These categories illustrate that damage in AI-driven contractual relations is not confined to immediate economic consequences, but may also encompass broader systemic and relational effects. In particular, the reliance on automated decision-making may undermine trust between contracting parties, especially when outcomes appear arbitrary, biased, or insufficiently explained.

Furthermore, AI systems capable of analyzing economic incentives may recommend breaches deemed “efficient” in microeconomic terms, even when such breaches impose disproportionate harm on the counterparty. While such recommendations may be rational from a purely economic perspective, they raise significant legal and ethical concerns, particularly in relation to the principles of good faith, fairness, and contractual balance. This highlights the need to reconsider how damage is assessed in AI-mediated environments, taking into account not only financial loss but also the broader impact on contractual equilibrium and the integrity of the contractual relationship¹⁶.

E) Comparative Perspectives: Civil Law vs Common Law Approaches:

Comparative legal analysis provides valuable insight into how different legal traditions respond to the challenges posed by AI-enhanced contracting. The divergence between common law and civil law systems becomes particularly evident when addressing issues of fault, intent, and causation in technologically mediated environments.

1. Common Law Systems:

Common law jurisdictions are generally characterized by flexible and pragmatic approaches to contractual liability. Concepts of fault and breach are often interpreted in light of economic efficiency and commercial practicality. This flexibility allows courts to accommodate evolving technological realities, including the use of artificial intelligence in contractual performance and decision-making. In particular, common-law systems have shown openness to economic models

such as the theory of “efficient breach,” which evaluates contractual non-performance in terms of overall economic benefit. However, when AI systems autonomously initiate or evaluate a breach, identifying the responsible party becomes significantly more complex¹⁷.

The absence of clear human intervention complicates the attribution of fault, requiring courts to reconsider traditional doctrines and possibly extend liability to those involved in the design, deployment, or supervision of AI systems.

For example, courts in England and the United States have traditionally relied on principles of breach of contract, negligence, and product liability to address technology-related disputes. Although these doctrines were not originally developed for autonomous AI systems, their flexibility has enabled courts to adapt existing legal concepts to emerging technological contexts. This pragmatic approach contrasts with the more codified structure of civil law jurisdictions, where legislative intervention is often required to address novel legal challenges.

2. Civil Law Systems:

In contrast, civil law systems place greater emphasis on the principles of contractual intent, cause, and moral obligation. These systems are traditionally grounded in the notion that contractual liability arises from a conscious and voluntary expression of will. The integration of AI into contractual processes challenges these foundational assumptions, particularly where decisions are generated through opaque and autonomous algorithmic mechanisms. The lack of transparency in AI-generated decisions may conflict with the requirements of informed consent and genuine agreement, thereby creating tension between technological practices and established legal doctrine. As a result, civil law jurisdictions may experience greater difficulty in adapting existing frameworks to accommodate AI-driven contractual relationships without significant doctrinal adjustments.

This issue is particularly visible in French and other continental European legal systems, where contractual liability remains closely linked to established concepts of consent, fault, and causation. Consequently, legislative reforms and regulatory initiatives have become increasingly important in facilitating the integration of AI technologies within existing legal frameworks.

3. European Regulatory Influence:

Recent developments within the European Union reflect an emerging effort to bridge these doctrinal gaps. Regulatory initiatives increasingly emphasize transparency, explainability, and accountability as core principles governing the use of AI systems. These reforms aim to restore legal certainty in AI-enhanced contracting by imposing obligations on developers and users to ensure that algorithmic decisions can be understood, traced, and, where necessary, challenged. By promoting a more structured and rights-based approach, European regulatory frameworks seek to reconcile technological innovation with the protection of fundamental contractual principles, including fairness, predictability, and legal security.

F) Towards a Renewed Model of Contractual Liability for AI:

Traditional contractual doctrines require adaptation to effectively address the complexities introduced by artificial intelligence. While existing legal principles remain conceptually relevant, their application in AI-enhanced environments reveals significant limitations. The increasing autonomy, opacity, and adaptability of AI systems necessitates the development of a forward-looking model of contractual liability capable of responding to these technological transformations.

A renewed model of contractual liability may involve several key adjustments:

- Broadening the concept of fault to include not only human negligence or intentional misconduct, but also algorithmic defects, design flaws, and failures in oversight. This expanded notion of fault reflects the distributed nature of responsibility in AI systems and ensures that liability is not artificially limited to traditional categories.
- Reconciling human will with algorithmic decision-making, by recognizing that contractual outcomes may result from a combination of human input and automated processes. This requires a more flexible understanding of consent and intention, capable of accommodating hybrid decision-making environments.
- Reconceptualizing causation for opaque computational processes, particularly where traditional linear models fail to capture the complexity of AI-driven interactions. This may involve adopting probabilistic approaches or alternative standards of proof that reflect the realities of algorithmic behavior.
- Imposing duties of transparency and supervision, ensuring that parties who deploy AI systems remain accountable for understanding, monitoring, and controlling their operation. Such duties are essential to mitigate risks associated with algorithmic opacity and to preserve trust in contractual relations.
- Redistributing liability among developers, providers, and users, in a manner that reflects their respective roles in the lifecycle of the AI system. This approach recognizes that harm may result from cumulative contributions rather than a single identifiable fault.
- Restricting reliance on “efficient breach” reasoning where it produces inequitable or disproportionate outcomes. While economic efficiency remains a relevant consideration, it should not override fundamental principles of fairness, good faith, and contractual balance¹⁸.

Taken together, these elements suggest that the future of contractual liability in AI-driven environments lies not in the abandonment of traditional doctrines, but in their careful adaptation. A balanced and responsive legal framework must integrate technological realities while preserving the core values of contractual justice, predictability, and accountability.

Conclusion:

The rapid integration of artificial intelligence into contractual relationships has exposed deep structural tensions within classical doctrines of private law. Traditional models of contractual liability grounded in human intent, identifiable misconduct, and linear causation prove increasingly inadequate when contractual performance is mediated, optimized, or autonomously executed by learning systems that operate beyond the boundaries of human oversight.

This study demonstrates that although the foundational pillars of contractual liability remain conceptually intact, their practical application requires renewed analytical tools capable of addressing algorithmic decision-making. The notion of contractual intent must accommodate hybrid environments in which human choices intersect with machine-generated recommendations. Fault must be reconceptualized to capture distributed failures arising from defective datasets, inadequate supervision, and unforeseen algorithmic evolutions. Similarly, causation must evolve to manage multi-layered decision chains whose opacity renders traditional evidentiary standards insufficient.

Comparative legal analysis reveals diverging responses across jurisdictions: while common-law systems display flexibility in accommodating AI-driven efficient-breach reasoning, civil law systems show deeper friction due to their emphasis on informed intent, voluntariness, and

moral obligations. Yet despite these doctrinal differences, a shared trajectory is emerging. Legal systems increasingly recognize the need for enhanced transparency, human-oversight duties, and shared accountability among developers, providers, and users of AI systems. Insights from emerging regulatory frameworks, particularly within the European sphere, suggest that contractual law is moving toward a risk-based model that situates liability within the broader lifecycle of AI technologies.

Ultimately, contractual liability in the age of autonomous decision-making must balance three imperatives: preserving the stability and fairness of contractual exchanges, enabling technological innovation, and protecting parties from opaque and unpredictable algorithmic behavior. The future of contracting depends not merely on adapting old doctrines, but on constructing legal frameworks that recognize the distributed agency of AI systems and ensure a fair allocation of risks in increasingly digitized contractual ecosystems. In this evolving landscape, the law must remain both principled and adaptive, capable of safeguarding autonomy, equity, and trust while embracing the transformative potential of intelligent technologies.

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- ¹⁴ European Union. *Draft AI Liability Directive*. Brussels, 2023
- ¹⁵ European Commission. *AI Governance Framework: Transparency and Accountability*. Brussels, 2024.
- ¹⁶ Bashar Talal Momani, Nasr Farid Hassan, Hosni Mahmoud AbdelDaiem AbdelSamad & Mohamed Elsayed Eldessouky, “Legal Challenges Related to Contractual Negotiations via AI Technologies: Comparative Analytical Study,” *Access to Justice in Eastern Europe*, Vol. 8 (Special Issue), 2025, pp. 5–7.
- ¹⁷ Liu, Yuan & Zakri, Izura Masdina Mohamed, Op. Cit., pp. 230–232.
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