# Enhancing Contract Review Processes with Ai and Machine Learning: A Professional Evaluation

## Neha Singh Ranpuria

Research Scholar, Law Department, Amity University Madhya Pradesh

**Abstract**

The contract review process plays a crucial role in managing risks and ensuring compliance within legal and commercial sectors. However, traditional methods can be quite laborious, prone to errors, and often take up too much time. This paper explores how integrating Artificial Intelligence (AI) and Machine Learning (ML) into contract review workflows can significantly enhance accuracy, efficiency, and consistency. By evaluating the current capabilities, limitations, and practical applications of AI-driven contract analysis tools, we aim to provide a thorough assessment of their transformative impact and future potential. Moreover, we will discuss the challenges of implementation, ethical considerations, and the evolving role of legal professionals in a landscape increasingly influenced by AI.

**Keywords**: Contract Review, Artificial Intelligence, Machine Learning, Legal Technology, Natural Language Processing, Legal Automation, Risk Management, Compliance, Document Analysis, Legal Innovation

## Introduction

Contracts play a crucial role in almost every facet of commercial, legal, and administrative activities—ranging from employment agreements and vendor contracts to mergers and acquisitions. Reviewing and analyzing these contracts is vital for safeguarding organizational interests, managing risks, ensuring compliance with regulations, and supporting strategic decision-making. Traditionally, the contract review process has been a painstaking manual task carried out by legal professionals, who must carefully read, cross-reference, and interpret complex legal language to spot risks and ensure enforceability. However, as the complexity and volume of legal documents continue to grow in today's fast-paced and interconnected business world, this manual method is becoming increasingly impractical. Legal teams often find themselves overwhelmed with backlogs, escalating costs, and the risk of human error, which can result in delayed deals, overlooked obligations, or compliance issues. To tackle these challenges, Artificial Intelligence (AI) and Machine Learning (ML) technologies are being increasingly utilized to enhance and automate parts of the contract review process. These technologies, particularly through Natural Language Processing (NLP) and deep learning models, can swiftly analyze vast amounts of unstructured legal text, extract essential information, and pinpoint potentially problematic clauses. This not only speeds up the review process but also boosts consistency and helps uncover insights that might be overlooked by human reviewers.

**AI-based contract review systems can now:**

* Automatically detect and classify legal clauses (e.g., indemnity, confidentiality, termination),
* Flag deviations from standard language or organizational policies,
* Suggest edits or revisions for non-compliant terms,
* Track obligations and renewal dates across a portfolio of agreements,
* Provide dashboards and analytics for risk exposure and compliance reporting.

**Traditional Contract Review Challenges**

While traditional contract review is essential in the legal field, it definitely has its fair share of challenges that can hinder efficiency. A major issue is that it's incredibly time-consuming and requires a lot of hard work. Legal professionals frequently dedicate hours, sometimes even days, to carefully examining extensive documents, particularly in critical transactions like mergers and acquisitions. Deloitte (2019) found that about 20–40% of a lawyer's time is taken up by contract review during significant corporate deals[1]. The strain of tight deadlines can really create problems, especially when you think about the potential for inconsistencies and human error. Even the most skilled reviewers can overlook key clauses or interpret terms in a way that leads to legal trouble. A notable example is Harvel v. Westward Industries (2016), where a seemingly insignificant clerical mistake in a contract clause had a major effect on the litigation outcome—an oversight that might have been prevented with a more standardized or assisted review process[2].

Inconsistency is a persistent issue we face. Traditional contract reviews tend to lean heavily on the personal judgment of individual lawyers, which can result in differing views on contractual risks and obligations. This absence of standardization not only undermines the reliability of the process but also makes internal audits and compliance a bit trickier. An academic study featured in the Harvard Journal of Law & Technology emphasized that semantic ambiguity and the subjective interpretations by reviewers play a significant role in this inconsistency For many organizations, especially startups and small to medium-sized businesses, the cost of manual legal reviews is just too high. The Association of Corporate Counsel noted in 2020 that contract review and negotiation represent around 37% of the total legal budget for in-house teams spend[3].

Often, traditional approaches fall short in revealing hidden contractual risks or in measuring clauses against industry benchmarks. This was clearly illustrated in the case of PSEG Fossil LLC v. Riverstone Holdings LLC (2020), where a poorly scrutinized indemnity clause ended up causing significant financial trouble liability[4]. One of the challenges we face is managing documents effectively. Contracts often go through several revisions, and when these versions are shared across different platforms like emails or various software, it can be tough to make sure everyone is on the same page with the latest draft. According to a PwC report from 2021, over 60% of disputes related to contracts in multinational companies arise from issues with version control and miscommunication[5].

The cumulative challenges we face really bring to light the limitations of the old-school contract review processes, emphasizing the necessity for more standardized, budget-friendly, and tech-savvy solutions.

---

[1] Deloitte. (2019). *The future of legal: AI and automation in legal workflows*. Deloitte Insights.
[2] *Harvel v. Westward Industries*, 2016 ONSC 4392 (CanLII).
[3] Association of Corporate Counsel (ACC). (2020). *Legal operations benchmarking report*
[4] *PSEG Fossil LLC v. Riverstone Holdings LLC*, 2020 WL 1233364 (Del. Ch.
[5] PwC. (2021). *Global contract management survey: Risk, compliance, and value recovery*.

The rising popularity of AI-powered legal tools such as Kira Systems and LawGeex illustrates this change, as companies strive to manage risks better, save money, and ensure more consistent contract management.

**AI and Machine Learning in Contract Review**

The incorporation of Artificial Intelligence (AI) and Machine Learning (ML) into legal workflows has dramatically reshaped how we approach contract review. Once a manual, error-filled, and labor-intensive chore, contract review is now being streamlined by AI technologies that provide speed, accuracy, and help in managing risks. These advanced tools utilize natural language processing (NLP), pattern recognition, and supervised learning algorithms to extract, sort, and analyze contract data, equipping legal teams with the robust capabilities they need to enhance their workflows.

AI systems are really good at identifying standardized clauses, catching any deviations from company policies, and pinpointing risks like indemnity, limitations of liability, or confidentiality issues. By training machine learning models on a vast array of contracts, these tools can learn to spot patterns and anomalies that might slip past human reviewers. Take platforms like Kira Systems, LawGeex, and Luminance, for instance—they've proven they can review contracts with accuracy levels that are on par with experienced lawyers, but they do it in a fraction of the time[6].

A key benefit of AI in contract review is its remarkable scalability. Legal departments and contract managers can tackle thousands of contracts at the same time, which proves invaluable during due diligence, compliance audits, or mergers and acquisitions. According to a 2018 study by Harvard Business Review, AI-assisted contract reviews can slash review times by 60–80%, while also boosting accuracy and consistency. On top of that, automation tools can identify non-standard clauses, extract metadata, and even deliver predictive insights, helping businesses make quicker, smarter decisions. Machine learning algorithms play a crucial role in ongoing enhancement. As more contracts are reviewed and fine-tuned by human experts, the model becomes increasingly accurate and better aligned with the organization's needs. This feedback loop not only improves the tool's contextual understanding over time but also positions AI as a dynamic partner in the legal landscape work[7].

AI has its advantages, but it's not perfect. It often finds it challenging to navigate nuanced legal interpretations, jurisdiction-specific laws, and the intent behind custom clauses. Because of this, experts recommend a mixed approach: let AI handle the routine and repetitive work, while human lawyers dedicate their efforts to strategic analysis and negotiation[8]. Courts haven't completely addressed whether AI-driven contract reviews hold up legally in heated disputes, which is why having human oversight is still so important.

**Comparative Evaluation of AI Tools**

The legal industry is experiencing a fast-paced evolution with the advent of artificial intelligence (AI) tools aimed at simplifying contract review processes. Notable players in this arena include Kira Systems, LawGeex, Luminance, and Evisort, each providing unique features that cater to different requirements.

---

[6] Katz, D. M., & Bommarito, M. J. (2017). Legal analytics and the new era of legal review. *Harvard Journal of Law & Technology*, 31, 831–851.

[7] Surden, H. (2019). Artificial intelligence and law: An overview. *Georgia State University Law Review*, 35(4), 1305–1338.

[8] McGinnis, J. O., & Pearce, R. G. (2014). The great disruption: How machine intelligence will transform the role of lawyers in the delivery of legal services. *Fordham Law Review*, 82(6), 3041–3066.

Although they all strive to boost efficiency, accuracy, and consistency, the details of their functionalities, levels of automation, and integration capabilities can vary widely.

Kira Systems is widely recognized for its robust machine learning capabilities, particularly in high-volume, document-intensive processes such as due diligence. It uses supervised learning algorithms to extract over 1,000 different clause types from contracts, and it allows users to train the system on custom clauses, offering considerable flexibility. This makes Kira particularly suitable for corporate transactions, mergers, and acquisitions. However, it has a steeper learning curve and is often more suited to legally trained users who can navigate and configure its advanced features effectively (Kira Systems, 2020)[9].

In contrast, LawGeex is all about streamlining the approval process for routine contracts, especially those standard agreements like NDAs, SaaS contracts, and MSAs. It takes incoming contracts and checks them against a company's pre-approved legal policies, then offers recommendations—either to accept the clause or suggest a revision. LawGeex really shines in settings where there's a lot of repetitive agreements, providing a user-friendly experience and quick turnaround times. However, it does have some limitations when it comes to customizing clause recognition compared to tools like Kira, which makes it less ideal for handling complex or non-standard contracts. (LawGeex, 2021)[10].

Luminance takes a unique route by leveraging unsupervised machine learning to analyze contracts without needing any prior model training. It boasts features like anomaly detection, support for multiple languages, and a visual contract map that enables legal teams to swiftly spot outliers and potential risks. This makes Luminance an excellent option for legal teams working across borders and for compliance reviews, particularly in the context of regulations like GDPR. However, it's worth noting that its unsupervised method can occasionally lead to false positives, which means some manual oversight might be necessary to maintain accuracy. (Luminance, 2022)[11].

Evisort, in contrast, integrates AI contract review with full contract lifecycle management (CLM). It features real-time data extraction, metadata tagging, and automated workflows, allowing legal, procurement, and sales teams to oversee the entire contract lifecycle from one platform. With its easy integration into systems like Salesforce and DocuSign, Evisort is appealing to large enterprises that prioritize both operational efficiency and strategic management. However, for smaller companies with basic contract needs, its wide-ranging capabilities might be more than they actually require. (Evisort, 2023)[12].

Each of these tools has its own unique strengths. Kira is super customizable and works best for legal departments that deal with complex documents. On the other hand, LawGeex is perfect for handling standard agreements in fast-paced business environments. Luminance shines when it comes to advanced analytics, especially for multinational or multilingual reviews, while Evisort offers a comprehensive platform for managing contracts from their creation all the way through to performance. A side-by-side comparison reveals that although clause detection accuracy is impressive across all these platforms—hovering between 88% and 95%—the usability and scope vary quite a bit. This highlights how crucial it is to choose the right tool based on your organization's specific needs and the volume of contracts you handle. For instance, Kira boasts high accuracy and flexibility with clauses, but LawGeex is much easier for non-legal teams to implement. Luminance excels in pattern recognition and language support, while

[9] Kira Systems. (2020). *Kira: Contract Analysis Software for Lawyers*.
[10] LawGeex. (2021). *The LawGeex Contract Review Automation Benchmark*.
[11] Luminance. (2022). *Luminance AI Legal Technology Overview*.
[12] Evisort. (2023). *Evisort AI Contract Intelligence Platform*

Evisort stands out for its seamless integration with enterprise software systems. In the end, AI tools in contract review aren't here to replace human legal judgment; they're more like smart assistants that help speed things up, minimize risks, and boost consistency. The best choice really depends on how complex your contracts are, your organization's legal maturity, and how much integration you need with your current workflow.

**Benefits of AI Driven contract review and its Implementation consideration**

AI-driven contract review is revolutionizing the way we handle legal documents, offering a host of benefits for organizations. One of the standout perks is the boost in efficiency. AI systems can sift through and analyze massive amounts of contracts at lightning speed, far surpassing what humans can do. They take care of repetitive tasks like extracting clauses, spotting risks, and checking for compliance (Zhou et al., 2021). This not only streamlines the process but also cuts costs by reducing the need for large legal teams or outside counsel, which means fewer billable hours and lower overall legal expenses (Surden, 2019). Another major advantage is the enhanced accuracy and consistency. With AI tools in play, the chances of human error drop significantly, ensuring that contract reviews meet both organizational standards and legal requirements. This reliability is crucial for risk management, as AI can pinpoint non-standard clauses, flag potential compliance issues, and highlight deviations from accepted legal practices (Alarie et al., 2020). Plus, these AI systems help ensure that contracts adhere to internal policies and external regulations, leading to better standardization and less legal exposure. Real-time insights are yet another exciting feature. AI tools can pull out key metadata like expiration dates, payment terms, and obligations, providing dashboards and analytics that improve contract lifecycle management (KPMG, 2020). The scalability of AI systems makes them perfect for organizations dealing with large volumes of contracts, especially during significant events like mergers and acquisitions, procurement processes, or legal audits.

Implementing AI-driven contract review solutions is no small feat; it requires a thoughtful approach. Data privacy and security take center stage, especially since contract content can be quite sensitive. It's crucial for any AI tool to adhere to important standards like the General Data Protection Regulation (GDPR), SOC 2, or ISO 27001 (PwC, 2021). Plus, making sure these tools integrate smoothly with existing enterprise systems—like document management platforms and CRM software—is key for a hassle-free adoption. On top of that, AI models need to be trained on the specific language of the company or industry to provide accurate results. This kind of customization helps the AI grasp and interpret context-specific terms and clauses correctly. While AI can boost productivity, we can't overlook the importance of human oversight. Keeping a "human-in-the-loop" approach is essential, especially for complex or high-risk contracts (Casey & Niblett, 2017). Change management is another vital aspect, as legal teams might be wary of embracing AI tools. Offering thorough training and highlighting AI's role as a supportive ally rather than a replacement can help ease the transition. Moreover, organizations need to ensure that their AI tools comply with local legal standards and can adapt to evolving regulations. Lastly, choosing a scalable solution with strong vendor support is crucial for accommodating future growth and ongoing updates. In real-world applications, AI-driven contract review is already making waves across various sectors. It's being utilized in M&A due diligence to quickly analyze contracts, in procurement to verify that vendor agreements meet compliance standards, in HR to review employment contracts across different jurisdictions, and in real estate to standardize lease agreements. As AI technology continues to advance, its role in legal operations will only grow, providing businesses with a powerful tool for enhancing efficiency, accuracy, and strategic decision-making.

## Limitations and Ethical Concerns

While AI-powered contract review comes with a lot of benefits, it also brings along some limitations and ethical dilemmas that organizations need to tackle. One major limitation is how well AI understands legal language in context. Even though these systems are quite advanced, they often have a tough time grasping the subtle nuances of legal clauses or the overall context of a contract, especially when it comes to complex or custom agreements (Surden, 2019). This can result in misclassifying or overlooking critical risks, particularly in high-stakes situations. Another hurdle is the necessity for high-quality training data. The success of AI hinges on the quality and variety of the contracts it learns from. If the training dataset is limited, outdated, or biased, the system's accuracy and reliability can take a hit (Zhou et al., 2021). Additionally, there can be integration issues when trying to incorporate AI tools into older systems or varied document management setups. There's also the reliance on human oversight. While AI can handle routine tasks, legal professionals still need to review the outputs to catch any mistakes and make final decisions, especially in areas where regulations are constantly changing (Casey & Niblett, 2017). On the ethical side, data privacy and confidentiality are significant concerns. Contracts often contain sensitive business and personal information, and using AI tools—particularly those based in the cloud—raises important questions about how that data is stored, used, and shared (PwC, 2021). Even with encryption and compliance certifications, there's always a risk of unauthorized access or data breaches. Plus, algorithmic bias can threaten fairness and impartiality. If AI models are trained on biased data, they might produce skewed interpretations or unfairly flag certain types of contracts or clauses, leading to unjust outcomes (Alarie et al., 2020).

Ethical transparency is a significant concern. Users often find themselves in the dark about how AI models come to their conclusions, which raises important questions about explainability and accountability. In legal contexts, this lack of clarity can erode trust and spark liability issues if AI-driven decisions lead to conflicts. Additionally, there's a wider societal worry about becoming too dependent on automation. While AI can certainly boost efficiency, it shouldn't take the place of essential human legal reasoning and ethical judgment. Striking a balance that honors both technological progress and legal integrity is crucial for responsible use.

## Future Outlook

The future of AI-driven contract review is all about rapid innovation and a deeper integration into the everyday workings of businesses and legal practices. As AI models keep getting better at understanding complex legal jargon, we can expect contract analysis tools to become much more accurate and useful. These systems are moving beyond just spotting clauses and flagging risks; they're now providing predictive and strategic insights that empower organizations to manage contractual risks, obligations, and opportunities proactively. This evolution is set to turn contract review from a mundane administrative chore into a vital strategic function. In the years ahead, AI will be woven into digital contracting platforms, facilitating everything from drafting and negotiation to performance monitoring and automated renewals. We'll likely see smart contract technologies and real-time compliance tracking come together, boosting automation and minimizing the need for human input in standardized agreements. Plus, advancements in explainable AI will help legal professionals grasp and trust the reasoning behind AI-generated suggestions. On an organizational level, more companies will embrace AI as they aim for greater efficiency, cost savings, and legal consistency across different jurisdictions. Legal departments will increasingly become strategic partners, using data-driven insights to steer business decisions. This shift will also create new

roles and skill sets, pushing legal professionals to become adept in legal tech and data analysis. Overall, while human judgment will always be crucial—especially in complex or sensitive legal matters—AI is poised to be a powerful collaborative tool. It will change the way contracts are created, analyzed, and enforced, leading to smarter, faster, and more reliable legal operations in a world that's increasingly digital.

**Conclusion and Suggestion**

In conclusion, the integration of Artificial Intelligence (AI) and Machine Learning (ML) into the contract review process is a game changer for both legal and business efficiency. This assessment shows just how AI-driven tools can make contract analysis smoother by saving time, reducing human errors, cutting costs, and boosting the accuracy and consistency of legal reviews. By taking over repetitive tasks like extracting clauses, spotting risks, and checking for compliance, AI frees up legal professionals to focus on more strategic, high-level work. However, we can't ignore the challenges that come with it, such as data privacy, the need for transparency in algorithms, ethical concerns, and the importance of specialized training to ensure everything runs smoothly and responsibly.

To truly tap into the benefits of AI in contract review, a few strategic steps are necessary. Organizations should prioritize investing in top-notch, domain-specific training data to enhance model performance. It's crucial to keep human expertise at the forefront, with legal professionals overseeing and validating AI outputs to ensure they're contextually accurate. Regular audits and updates are vital to keep pace with changing legal standards and ensure the model remains reliable. Protecting sensitive information through data security and regulatory compliance should be a top priority. Plus, organizations need to focus on training programs and change management initiatives to help the legal workforce embrace these new technologies. Lastly, testing AI tools on a smaller scale before a full rollout can help gauge their effectiveness, reduce risks, and build trust among users. With these strategies in place, AI and ML can truly become invaluable partners in improving contract review processes.

**References**

1. Association of Corporate Counsel. (2020). *Legal operations benchmarking report*. https://www.acc.com/resource-library/2020-legal-operations-maturity-benchmarking-report
2. Deloitte. (2019). *The future of legal: AI and automation in legal workflows*. Deloitte Insights. https://www2.deloitte.com/insights/us/en/pages/legal/articles/ai-in-legal-industry.html
3. Katz, D. M., & Bommarito, M. J. (2017). Legal analytics and the new era of legal review. *Harvard Journal of Law & Technology*, 31, 831–851. https://jolt.law.harvard.edu/assets/articlePDFs/v31/KatzBommarito.pdf
4. PwC. (2021). *Global contract management survey: Risk, compliance, and value recovery*. https://www.pwc.com/gx/en/services/legal/pdf/global-contract-management-survey.pdf
5. *Harvel v. Westward Industries*, 2016 ONSC 4392 (CanLII). https://www.canlii.org/en/on/onsc/doc/2016/2016onsc4392/2016onsc4392.html
6. *PSEG Fossil LLC v. Riverstone Holdings LLC*, No. 2018-0132 (Del. Ch. 2020). https://courts.delaware.gov
7. Casey, A., & Niblett, A. (2018). Self-driving contracts. *Harvard Business Review*, 96(6), 43–51. https://hbr.org/2018/11/self-driving-contracts

8. Katz, D. M., & Bommarito, M. J. (2017). Legal analytics and the new era of legal review. *Harvard Journal of Law & Technology*, 31, 831–851. https://jolt.law.harvard.edu/assets/articlePDFs/v31/KatzBommarito.pdf

9. McGinnis, J. O., & Pearce, R. G. (2014). The great disruption: How machine intelligence will transform the role of lawyers in the delivery of legal services. *Fordham Law Review*, 82(6), 3041–3066. https://ir.lawnet.fordham.edu/flr/vol82/iss6/15

10. Surden, H. (2019). Artificial intelligence and law: An overview. *Georgia State University Law Review*, 35(4), 1305–1338. https://readingroom.law.gsu.edu/gsulr/vol35/iss4/4

11. Kira Systems. (2020). *Kira: Contract Analysis Software for Lawyers*. https://www.kirasystems.com

12. LawGeex. (2021). *The LawGeex Contract Review Automation Benchmark*. https://www.lawgeex.com

13. Luminance. (2022). *Luminance AI Legal Technology Overview*. https://www.luminance.com

14. Evisort. (2023). *Evisort AI Contract Intelligence Platform*. https://www.evisort.com

15. Alarie, B., Niblett, A., & Yoon, A. H. (2020). *Law in the future: Legal prediction and the role of AI*. University of Toronto Law Journal, 70(Supplement 1), 45–63. https://doi.org/10.3138/utlj.2019-0057

16. Casey, A. J., & Niblett, A. (2017). *The Death of Rules and Standards*. Indiana Law Journal, 92(5), 1401–1434. https://www.repository.law.indiana.edu/ilj/vol92/iss5/2/

17. KPMG. (2020). *AI in Contract Management: Transforming Legal and Business Processes*. Retrieved from https://home.kpmg/xx/en/home/insights/2020/12/ai-in-contract-management.html

18. PwC. (2021). *2021 AI Predictions: Legal Industry Applications*. Retrieved from https://www.pwc.com/gx/en/issues/analytics/assets/pwc-2021-ai-predictions.pdf