Exploring Contract Management in the Digital Age: The Impact of Artificial Intelligence

Abhijeet Kumar Srivastawa[a]

[a]Lawyer

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Contracts have been the bedrock of legal relationships since ancient times, evolving from oral agreements to written ones. The management of contracts has advanced through the ages, from quills to typewriters, physical storage to the cloud, and now to Artificial Intelligence (AI). The legal industry is at the cusp of a technological revolution, with AI poised to reshape the way contracts are created, reviewed, and managed. AI, harnessing Machine Learning (ML), Large Language Models (LLM), and Natural Language Processing (NLP), can swiftly analyze vast volumes of contractual documents with remarkable precision. It excels in identifying key terms, and clauses, and assessing risks. Combined with ML, LLM and NLP, AI-powered contract management systems streamline the entire process including contract creation, negotiation, review, storage, and compliance. During contract negotiation, AI can identify potential disputes and risk factors, aiding in the creation of risk-free clauses. AI-driven contract review software accelerates the review process and minimizes human errors. However, it's important to recognize that current AI systems, while promising, have limitations, including biases, the lack of emotional intelligence in client interactions, and the susceptibility to cyber-attacks. This Article underlines the significance of the adoption of AI to increase efficiency, productivity, accuracy, and limitations.

Keywords: *contracts, artificial intelligence, machine learning, contract management systems, negotiation.*

INTRODUCTION

Artificial Intelligence (AI) is considered a key component of the Fourth Industrial Revolution, also known as Industry 4.0 or 4IR, which is characterized by the integration of digital technologies, data analytics, the Internet of Things (IoT), automation, and AI across various industries and sectors.[1] It is rapidly changing the landscape of the digital age through its pervasiveness in our daily lives. We, now, casually use various AI applications daily - for image generation Midjourney or DALL-E, for content generation ChatGPT or Bard. The legal industry, too, has been inundated by AI, and one of its key applications is in the realm of contract management.

Contract management refers to the process of creating, negotiating, executing, revising, and renewing contracts.[2] These processes have traditionally been paper-intensive and reliant on manual processes, which AI is all set to transform. AI can process and analyze large volumes of contractual documents at speeds far exceeding human capabilities, improving efficiency and reducing the risk of errors and contract disputes in contract management processes.

Although the integration of AI into the legal industry offers significant benefits in terms of efficiency and data processing capabilities, the need for human intervention remains inevitable when dealing with complex legal issues, potential client frustration or dissatisfaction, personalization, bias, empathy, and objectivity.[3] The legal industry should embrace this transformation cautiously, addressing AI's limitations while harnessing its potential to navigate the evolving landscape of contract management. The optimal approach will involve synergy between AI and human legal practitioners to achieve the best outcome for the client and the legal profession as a whole.

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[1] Aryan Darsh, 'Industry 4.0 and its consequences' *The Times of India* (24 January 2019) <https://timesofindia.indiatimes.com/readersblog/yourstory/industry-4-0-and-its-consequences-1481/> accessed 18 October 2023

[2] Bennett Conlin, 'The Fundamentals of Contract Management' *Business Daily News* (21 February 2023) <https://www.businessnewsdaily.com/4813-contract-management.html> accessed 14 October 2023

[3] Vicky Hart, 'The pros and cons to using Artificial Intelligence in the Contact Center' (*New Era Technology,* 06 June 2023) <https://www.neweratech.com/uk/blog/the-pros-and-cons-to-using-artificial-intelligence-in-the-contact-center/> accessed 18 October 2023

EVOLUTION OF CONTRACT MANAGEMENT

The origins of contracts can be traced back to ancient civilizations, such as Mesopotamia, Egypt, and India. Early in those days, contracts were largely orals, but inscribed agreements on clay tablets recording transactions and obligations have also been found. The usage of papyrus scrolls has also been ascribed to the Egyptians. The evolution continued with the ancient Greeks and Romans, who introduced the idea of enforceable contracts backed by legal systems and authorities.[4]

During the Middle Ages, European countries, especially Britain, took up the task of furthering contract management. However, contracts were often oral and their enforcement relied heavily on the trust of agreeing parties, and local courts had little role to play in enforcement and remedies. With the emergence of the English common law, written contracts became more common, and legal systems began to provide remedies for breach of contract. The quills and papers dominated this period.

The Renaissance paved the way for the First Industrial Revolution (Industry 1.0) of the late 18th and early 19th centuries, which led to a rise in large-scale industries. With the huge growth in the industrial economy, the contracts became pervasive from employment contracts to sales and purchases, and transportation.[5] In the late 19th century, the typewriter was invented which started replacing quills, nonetheless, the managing and tracking of contracts remained manual and paper-based.

The 20th century witnessed several innovations in contract management. In the early 20th century, the widespread adoption of typewriters simplified the drafting process. The contracts became legible. Multiple copies of the same contract could be made simultaneously. They could be more easily edited than handwritten ones. So, typewriters reduced the time and effort

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[4] Joy Cunanan, 'From Barter to Written Agreements: A Look into the History of Contracts' (*LEXAGLE*, 13 June 2023) <https://www.lexagle.com/blog-en-sg/from-barter-to-written-agreements-a-look-into-the-history-of-contracts> accessed 18 October 2023

[5] *Ibid*

required for producing contracts, enabling law firms to handle a large volume of documentation.

In the late 1950s, photocopy machines were invented which streamlined document replication. Photocopiers reduced the time and effort required to create multiple copies of contracts and enhanced the legibility of copies of counterparts, ensuring that counterparts were as clear and readable as the original. During the 1960s and 1970s, fax machines became pervasive, enabling rapid document transmission over long distances. It saved time and money spent on the physical transmission of the documents.

In the 1990s, with the decrease in the cost of computers combined with the advent of the Internet and e-mail becoming the de facto standard for business communication, contract management software began to emerge, providing organizations with the ability to store and retrieve contract documents more efficiently. However, these early contract management systems primarily focused on document storage in offline mode.[6] The contracts were first typed on a computer, then printed, followed by scanned, faxed/emailed to the other party. The other party had to print, review, put signatures, scan, and send it back. Therefore, the manual labour in the Law firms continued. The early technology couldn't simplify contract management leaving it paper-intensive.

In the early 2000s, electronic signatures (e-signs) started replacing wet signatures. Now, the simple act of adding an electronic signature to contracts can save an organization an average of $36 per document by saving time and cutting the hard costs of printing, scanning, faxing, and shipping.[7] E-signs are more secure than wet signatures. Aadhaar e-sign being used in India is also a form of e-sign.

The 21st century has brought about a revolution in contract management, driven by the advent of digital technology. Contract Lifecycle Management (CLM) systems have become essential

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[6] Ajay Agrawal, 'The Evolution Of Contract Management: From Box To Bot' (*Sirion*) <https://www.sirion.ai/blog/evolution-contract-management/> accessed 18 October 2023

[7] Austin Miller, 'The Evolution of the Contract Management Process' (*DocuSign*, 01 September 2021) <https://www.docusign.com/blog/the-evolution-the-contract-management-process> accessed 18 October 2023

tools for organizations. These systems offer end-to-end contract management. CLM systems are cloud-based contract management systems. Using the CLM software, one can either create a contract from scratch or use a template available on the said software with modification, and send it to the other party. The next step is negotiation where parties suggest changes to be made through suggesting tools. Once both parties have mutually approved the contract, it is executed using e-signature technology. After the execution, the contract is stored on the cloud that can be accessed remotely.[8] Indeed, CLM systems are a great relief for organizations, it has increased productivity, accuracy, and revenue. Nonetheless, AI has the potential to be a complete game-changer in the world of contract management.

AI: TRANSFORMING CONTRACT MANAGEMENT IN THE DIGITAL AGE

AI leverages technologies such as Machine Learning (ML), Large Language Models (LLM), and Natural language Processing (NLP) that are trained on huge amounts of data to generate responses. Their databases are fed with risk-free manually examined contracts by contract experts leaving little or no room for error. Moreover, these technologies are trained to incorporate feedback so they keep correcting their mistakes and improving their accuracy. They work efficiently while identifying key terms, clauses, and obligations or assessing contract risks.[9]

While ML utilizes its data and experience to imitate the human learning process and gradually improves in accuracy over time, LLM uses advanced deep learning techniques and vast datasets to understand queries and generate responses through prompts. The role of NLP becomes crucial in helping AI to understand the language of the documents, the contents of documents, and the contextual subtlety within them, which results in the extraction of accurate information, categorization, and organization of the document. It betters AI's vocabulary, grammar, and semantics of contract text. It enables AI systems to understand and interpret human language

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[8] 'What is Contract Lifecycle Management? CLM Explained' (*Ironclad*)
<https://ironcladapp.com/journal/contract-management/contract-lifecycle-management/> accessed 18 October 2023
[9] Krishnapriya Agarwal, 'AI Contract Analysis: Saving Time and Increasing Efficiency' (*SPOTDRAFT*, 13 July 2023) <https://www.spotdraft.com/blog/ai-contract-analysis> accessed 18 October 2023

in contracts, so analysis of contracts becomes easy.[10] Combined with ML, LLM, and NLP, the AI-powered contract Management System is bringing a digital revolution to the legal sector. These systems provide a centralized repository for contracts, making it easy to create, store, search, retrieve, and monitor them.

For example, Chat GPT, a Generative AI, released in November 2022, has become a popular AI tool. It has set a record for the fastest-growing consumer application in history.[11] Having a vast repository of legal information, ChatGPT can assist legal professionals in several tasks including research, drafting, negotiation, vetting, and risk analysis.

With AI, one can say goodbye to stacks of paper contracts and the endless search for crucial documents. AI-powered contract software can recognize patterns and extract and classify key terms such as clauses, dates, and parties from a pile of contracts, provided they are trained on large databases containing contracts. It can also identify contract types. It can perform due diligence by quickly scanning through large volumes of contracts and flagging risks and gaps in the contracts.[12]

AI can help organizations keep specific terms and definitions consistent across all their contracts. For example, if organizations have defined confidentiality in a specific way in a non-disclosure agreement and want to use the same definition in all of their contracts, AI can easily keep the definition of confidentiality the same across all contracts.[13]

AI can be deployed during the negotiation stage. It can utilize its database to analyze different types of contracts and languages within them. It can suggest what words or clauses might lead to disputes in the future. One can leverage AI's analysis during negotiation to incorporate risk-

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[10] *Ibid*

[11] Krystal Hu, 'ChatGPT sets record for fastest-growing user base - analyst note' (*Reuters*, 02 February 2023) <https://www.reuters.com/technology/chatgpt-sets-record-fastest-growing-user-base-analyst-note-2023-02-01/> accessed 18 October 2023

[12] Beverly Rich, 'How AI Is Changing Contracts' (*Harvard Business Review*, 12 February 2018) <https://hbr.org/2018/02/how-ai-is-changing-contracts> accessed 18 October 2023

[13] *Ibid*

free clauses in contracts. With the help of AI, the negotiation process can be expedited and the parties involved are likely to reach mutually beneficial terms in less time.

The task of reviewing contracts is one of the most time-consuming tasks. Each clause needs to be looked closely for key terms and errors within them. It takes thousands of hours to review a single contract manually, but AI-driven contract review software can extract and categorize contract clauses accurately and quickly and can help in risk assessment and mitigation by identifying potential legal and financial risks in contracts. This not only saves time but also reduces the risk of human errors that can be costly.[14] For example, JP Morgan Chase & Co., a bank in the United States of America, has developed an AI-powered system called COIN (Contract Intelligence) that can review 12,000 commercial loan agreements in seconds, for which their lawyers took 360,000 hours a year.[15]

The CLM technology discussed above, which is currently semi-automated, can transform into fully automated through the integration of AI which can enhance the overall contract management process, making it more streamlined and efficient. It can play a pivotal role in tasks such as contract drafting, negotiation, vetting, and ensuring compliance, reducing the risk of legal disputes.[16] Full automation can significantly save the time, money, and effort traditionally required for these tasks.

AI can play a role in the development and management of smart contracts. Smart contracts function on blockchain technology which is a decentralised public digital ledger. These contracts are called smart contracts because they are automated, self-executing, and immutable agreements that rely on predetermined conditions. For example, Smart contracts typically include if, when, and then in the statements that define the conditions and actions to be taken

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[14] *Ibid*

[15] Dom Galeon, 'An AI Completed 360,000 Hours of Finance Work in Just Seconds' (*Futurism*, 09 March 2017) <https://futurism.com/an-ai-completed-360000-hours-of-finance-work-in-just-seconds> accessed 18 October 2023

[16] Sarvarth Misra, 'AI vs. ML in CLM: Making Sense of Contract Management Technology' (*AiThority*, 26 February 2020) <https://aithority.com/guest-authors/ai-vs-ml-in-clm-making-sense-of-contract-management-technology/> accessed 18 October 2023

when those conditions are met.[17] In recent times, they have gained huge popularity for being swift, efficient, accurate, and inexpensive. They remove the need for an intermediary to handle transactions. Since blockchain transactions are encrypted, they are secure and not easy to hack. Transparency is a key pillar of blockchain technology, its digital ledger is decentralized which is available to the public all the time, and it is not controlled by a single entity, a group of computers updates its ledger, making them easy to trust. Here, AI can assist in creating and verifying the code, ensuring that smart contracts function as intended on the blockchain platform.

Once contracts are executed, their compliance becomes the top priority. Organizations with a huge volume of contracts find themselves in a quagmire when it comes to keeping track of compliance with terms such as renewal dates, payment schedules, rights and obligations, and renegotiation terms; manually it takes hours and a large and efficient team of contract experts. AI can assist here by monitoring contracts and ensuring that organizations adhere to terms set forth and legal and regulatory requirements. By flagging potential compliance issues, AI can help avoid legal troubles and financial penalties.

ISSUES PLAGUING AI IN CONTRACT MANAGEMENT

Today's AIs that we are using are Generative Artificial Intelligence, also called GenAI. It is so because they generate content, such as text, images, or music. They are not Artificial General Intelligence (AGI) which is a thing of the future that is supposed to possess the general intelligence and cognition that humans possess. GenAI systems are trained on a database to perform particular tasks or solve specific problems, they are just better than traditional AI. AGI, on the other hand, is a more advanced form of AI that is still largely theoretical. AGI would have the ability to understand, learn, and apply knowledge like a human being. It would possess a

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[17] 'What are smart contracts on blockchain?' (*IBM*) <https://www.ibm.com/topics/smart-contracts> accessed 18 October 2023

level of cognitive ability, reasoning, and adaptability that goes beyond the narrow AI and task-specific current GenAI.[18][19]

For example, ChatGPT, a GenAI, has some limitations. It is susceptible to bias which arises from the data used for training. It has limited knowledge. It is unable to spot spelling and grammatical errors of users prompting queries. It can't handle multiple tasks at the same time. Sometimes, it has trouble understanding the context. And, it also lacks human-level common sense[20] This means that ChatGPT, while powerful and capable of generating human-like text, can sometimes produce nonsensical or inaccurate responses.

ChatGPT has generated false judicial opinions and cited fake cases that didn't exist. A Federal District Court of New York fined lawyers for using ChatGPT to prepare a legal brief for a case that was filled with fictitious or fake cases and judicial opinions.[21] This example highlights the importance of proper training, oversight, and verification when using AI in the legal profession. Therefore, AI needs to be well trained on reliable and authoritative sources to minimise such risks and errors. It is crucial to exercise caution when relying on AI for tasks like preparing legal documents as AI is only as good as the data it is trained on.

AI might develop glitches or go rogue, in that case, the contract management system would be at risk. Snapchat's AI, an instant messaging app, went rogue and started posting stories.[22] This instance shows that it is important to acknowledge that AI is not immune to technical issues or

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[18] Bernard Marr, 'The Difference Between Generative AI And Traditional AI: An Easy Explanation For Anyone' (*Forbes*, 24 July 2023) <https://www.forbes.com/sites/bernardmarr/2023/07/24/the-difference-between-generative-ai-and-traditional-ai-an-easy-explanation-for-anyone/> accessed 18 October 2023
[19] Philip Maymin, 'Artificial General Intelligence (AGI) Is One Prompt Away' (*Forbes*, 13 October 2023) <https://www.forbes.com/sites/philipmaymin/2023/10/13/artificial-general-intelligence-agi-is-one-prompt-away/> accessed 18 October 2023
[20] Bernard Marr, 'The Top 10 Limitations Of ChatGPT' (*Forbes*, 03 March 2023) <https://www.forbes.com/sites/bernardmarr/2023/03/03/the-top-10-limitations-of-chatgpt/> accessed 18 October 2023
[21] Sara Merken, 'New York lawyers sanctioned for using fake ChatGPT cases in legal brief' (*Reuters*, 26 June 2023) <https://www.reuters.com/legal/new-york-lawyers-sanctioned-using-fake-chatgpt-cases-legal-brief-2023-06-22/> accessed 18 October 2023
[22] Samantha Murphy Kelly, 'Snapchat users freak out over AI bot that had a mind of its own' *CNN Business* (16 August 2023) <https://edition.cnn.com/2023/08/16/tech/snapchat-my-ai-chatbot-glitch/index.html> accessed 18 October 2023

unintended behavior. Glitches or AI going rogue can pose risks in contract management. Hence, organizations and professionals need to maintain a proactive approach to AI contract management. This includes rigorous testing, monitoring, and implementing safeguards to prevent and address potential issues with AI systems. It's also important to have human oversight and a contingency plan in place to rectify any problems that may arise.

The Cyberspace Administration of China wants AI systems to abide by the country's laws and regulations, adopt core socialist values, respect social morality, public order, good customs, and many other prohibited grounds.[23] When governments or regulatory bodies impose guidelines, it is advisable to follow them. But instead of constitutional morality requiring AI to comply with social ethics, adopting a specific political belief rather than making AI aware of all political ideologies is tantamount to creating a myopic AI full of biases that will derail technological progress and the advancement of the human race. Therefore, biases incorporated into AI can affect its judgement in contract management.

Another important limitation it faces is that it lacks emotional intelligence which is a must while dealing with clients in the legal profession. AI may not be able to provide the same level of empathy as a lawyer provides.[24] Daniel Goleman explains that emotional intelligence is just as important as the intelligence quotient (IQ). While the intelligence quotient is the brain only, emotional intelligence is both the brain and the heart combined.[25] A lawyer is not only trained in legal writing, research, and oratory but also in understanding the sensitivity of the cases and clients and dealing with them accordingly. Thus if AI is to be utilised in the legal profession, it must imbibe all the qualities of a lawyer.

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[23] Menaka Guruswamy, 'Menaka Guruswamy writes: Can AI be communist?' *The India Express* (22 July 2023) <https://indianexpress.com/article/opinion/columns/menaka-guruswamy-writes-can-ai-be-communist-8853400/> accessed 18 October 2023

[24] Giulia Gentile, 'LawGPT? How AI is Reshaping the Legal Profession' (*LSE Impact Blog*, 08 June 2023) <https://blogs.lse.ac.uk/impactofsocialsciences/2023/06/08/lawgpt-how-ai-is-reshaping-the-legal-profession/> accessed 18 October 2023

[25] Daniel Goleman, *Emotional Intelligence: Why It Can Matter More Than IQ: & Working with Emotional Intelligence* (Bloomsbury 2004)

To operate efficiently, AI requires sophisticated computational resources including specialized hardware, software systems, a large volume of accurate databases for training, and proper cybersecurity apparatus.[26] Additionally, legal professionals need to be trained in data science and algorithms to bridge the information gap.[27] These requirements can be quite inexpensive for organizations. Organizations adopting AI should not expect immediate returns on their investments in building or integrating AI infrastructure. It costs OpenAI approximately $700,000 per day to operate ChatGPT.[28]

While providing many benefits, AI may become a double-edged sword introducing new security challenges and vulnerabilities if not properly monitored.[29] Cyber attackers can exploit these vulnerabilities, potentially leading to a data breach, including sensitive and confidential information. Terms like confidential information and intellectual property have financial significance attached to them in contracts. Just imagine what would happen if Coca-Cola's trade secrets (which it never divulges) were leaked, anyone could start selling counterfeit Coca-Cola, leading to a loss of revenue for the company. Once hacked, AI can be tricked by adversaries to provide unexpected, unintended, or harmful responses which require organizations using AI to prioritize cybersecurity measures. Therefore, although GenAI promises to increase efficiency, its application in the legal world is fraught with dangers that require human intervention.

CONCLUSION AND WAY FORWARD

In every business transaction, contracts play a pivotal role by providing the legal framework that defines the rights, duties, and responsibilities of the involved parties. This legal framework establishes a relationship between the involved parties, and the enforceability of contracts solely depends on the legality of the terms of the contract. To ensure that, contract lawyers spend

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[26] Marr (n 20)

[27] Gentile (n 24)

[28] Aaron Mok, 'ChatGPT could cost over $700,000 per day to operate. Microsoft is reportedly trying to make it cheaper.' *Business Insider India* (20 April 2023) <https://www.businessinsider.in/tech/news/chatgpt-could-cost-over-700000-per-day-to-operate-microsoft-is-reportedly-trying-to-make-it-cheaper-/articleshow/99637548.cms> accessed 18 October 2023

[29] Peter Klimek, 'Why generative AI is a double-edged sword for the cybersecurity sector' (*VentureBeat*, 27 August 2023) <https://venturebeat.com/security/why-generative-ai-is-a-double-edged-sword-for-the-cybersecurity-sector/> accessed 18 October 2023

endless hours on legal research - relevant laws, rules, or regulations - while negotiating between parties, drafting, reviewing, and managing contracts. While drafting one has to maintain the purity of the document, and during reviewing one has to go through the whole document by reading each page line by line to spot errors. These woes get compounded in big organizations where a large volume of contracts has to be managed. This manual contract management is not only costly and time-consuming but also leads to inefficiencies, a decrease in productivity, and errors jeopardizing the validity of the contract.

AI, which has immense capabilities, can be a game-changer in contract management. It can draft clauses while maintaining their legality, review contracts, identify anomalies, and conduct due diligence. It can save time, improve efficiency, and increase productivity, and revenue. As AI continues to take up the jobs of contracting professionals, there is a fear that organizations will need fewer lawyers. But this is not completely true. Lawyers' roles in organizations may transform, they will spend more time in high-value work like providing solutions to complex legal problems, rather than in document drafting and review.[30]

However, the legal sector has to tread the intersection of the law and AI cautiously, given AI's limitations such as inherent biases, and lack of emotional intelligence while dealing with clients, and cyber-attacks. AI systems need to be trained on accurate and unbiased data and regularly monitored to keep them immune to cyber-attacks. Before the adoption of AI, the organization should ensure to train and validate AI models for accuracy and reliability and engage with technology experts.[31] Proper training, validation, and quality control are key to harnessing the potential of AI responsibly and effectively.

The global legal tech market which generated revenues of $27.6 billion in 2021, is projected to grow at a compound annual growth rate of over four percent until 2027.[32] The legal market is

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[30] Rich (n 12)

[31] Agarwal (n 9)

[32] Zameer Nathani, 'The Changing Landscape of Legal Industry: The Impact of AI Adoption' *The Economic Times* (01 August 2023) <https://legal.economictimes.indiatimes.com/news/opinions/the-changing-landscape-of-legal-industry-the-impact-of-ai-adoption/102314570> accessed 18 October 2023

poised to reap the benefits of AI, but it should be mindful of the limitations of AI. The legal industry must be cautious while implementing AI and ensure that it complements human expertise rather than replacing it entirely. AI should be a tool to assist legal professionals and enhance their work, but it should not be relied upon blindly.