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The Utilization of Artificial Intelligence as a Contract Review Tool for Government Procurement of Goods and Services to Mitigate Legal Risks

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ABSTRACT

This study examines the application of Artificial Intelligence (AI), specifically Natural Language Processing (NLP), as a strategic tool in reviewing government procurement contracts to mitigate legal risks. Manual contract review processes are often inefficient, prone to human error, and unable to keep up with the volume and complexity of government contracts. Using a normative-judicial legal research method, the study analyzes how AI integration can enhance legal certainty, efficiency, and accountability in public procurement. Through document digitization, standardized contract formats, and audit trail systems, AI can identify ambiguous or risky clauses, verify compliance with regulations, and provide recommendations supported by legal data and precedents. The study also investigates the current legal framework in Indonesia, identifying gaps that hinder AI implementation in administrative practices. While the ITE Law and Presidential Regulations offer a foundation for digital systems in governance, there is still no specific regulation governing AI use in legal decision support. Comparative insights from the UK, US, EU, and Morocco show that AI has improved review accuracy, reduced processing time, and strengthened public sector integrity, although concerns over transparency and algorithmic accountability persist. The study concludes that the integration of AI into procurement contract management offers significant potential for bureaucratic reform and risk mitigation, but requires robust legal frameworks, clear boundaries of responsibility, and institutional readiness. With adaptive policy support, ethical oversight, and inter-agency collaboration, AI can serve as a transformative instrument for enhancing good governance, preventing legal disputes, and protecting public officials in the execution of procurement responsibilities.

Keywords: *Artificial Intelligence; Contract Review; Public Procurement; Legal Risk Mitigation; Natural Language Processing; Government Accountability; Administrative Law*

INTRODUCTION

Contract review is an essential part of the government procurement process for goods and services, requiring a high level of legality, transparency, and accountability. All stages, from planning to contract execution, must comply with applicable legal provisions (Pane, 2017). Thus, contract review is a necessity, as contracts define the scope of work, payment, responsibilities, dispute resolution processes, and other binding terms between the employer and the contractor (Dikmen et al., 2025). Conducting a comprehensive contract review helps ensure that the contract is well-defined, legally valid, and aligned with the organization's objectives (Egbumokei et al., 2024). Neglecting contract review may result in ambiguity in an agreement or contract, requiring legal interpretation based on the principle of *contra proferentem* that is, interpreting the ambiguity against the party that proposed or drafted the agreement (the drafter), and in favor of the party that merely accepted its contents. This is a key principle in civil law to protect the weaker party in a contract (Article 1349 of the Indonesian Civil Code).

In practice, contract review is still often conducted manually and administratively, without a thorough examination of clause content that may pose legal risks. Manual reviews are also time-consuming, especially when lawyers face a surge in contract volumes (Kumar & Kumari, 2024). Technological advancements particularly Artificial Intelligence (AI) offer new solutions in the form of automation and intelligent analysis of legal documents (Siino et al., 2025a). The abundance of tender and contract documents makes it challenging for reviewers to keep up, as the task is time-intensive. AI can manage this workload and substantially reduce the time required for contract preparation (Tirmizi & Arif, 2022). AI systems can also perform many tasks traditionally done by lawyers, such as contract analysis and case prediction (Gravett, 2020). Using AI through natural language processing (NLP) technology can help identify contractual clauses that are inconsistent with legal regulations, provide jurisprudence-based recommendations, and significantly accelerate the legal review process (Kim et al., 2025).

Despite the potential of AI in public procurement both in terms of acquiring AI systems by government institutions and leveraging AI for procurement management the global application of AI in public procurement remains limited and faces major challenges. These include the lack of quality data infrastructure, the need for regulation and dedicated oversight bodies, and the necessity for an interdisciplinary approach combining legal, technological, and managerial perspectives (Sava, 2023). This aligns with the findings of Guida et al., which show that AI adoption in the procurement of goods and services is still in its early stages. Nonetheless, the technology has already demonstrated key benefits, such as time efficiency, enhanced spending analysis, and improved risk management in the supply chain. However, significant challenges such as unstructured data, limited technical expertise within procurement units, and cultural barriers still hinder widespread AI adoption (Guida et al., 2023).

Optimally leveraging Artificial Intelligence (AI) in the contract review process for government procurement offers several strategic benefits. These include time efficiency where processes that previously took days can now be completed within minutes and consistency of evaluation, as AI analyzes based on standardized parameters and is free from individual bias. Moreover, AI systems can enhance compliance with regulations, as they can be regularly updated in line with evolving legal frameworks, and they can provide stronger legal protection for Commitment-Making Officials (Pejabat Pembuat Komitmen, PPK), since every decision is systematically documented and accountable through objective analysis. Thus, optimizing AI for contract review is not merely a technological transformation but a strategic step toward strengthening accountability, transparency, and legal certainty in the national procurement system. Although challenges such as regulatory gaps, ethical concerns, and human resource readiness remain, with good governance and supportive policies, AI holds great potential to become a strategic partner in bureaucratic reform and contract oversight in the digital era.

The novelty of this study lies in the integration of Natural Language Processing (NLP) technology as a legal analysis tool in the previously manual process of government contract review. This approach has not been comprehensively examined in Indonesian administrative law literature, especially in terms of directly linking AI with legal risk mitigation in public procurement. By emphasizing the importance of integrating AI into government contract management systems and the need for transparent regulation

and audit trails, this study not only proposes technological innovation but also offers a new framework for modern administrative law. This approach can serve as a foundation for developing new legal policies and instruments suited to the digital era, while also providing stronger legal protection for public officials such as PPKs.

Contracts are legally binding agreements between the involved parties (Karati, 2023). Therefore, the contract review process is crucial to ensure that contracts meet all legal requirements and optimally protect the interests of all parties. First, contract review ensures compliance with applicable laws and regulations. Each clause must align with positive law to avoid the contract being rendered void or subject to annulment. This process minimizes the risk of disputes arising from unclear or unlawful clauses (Syahputra & Santiago, 2024). Prolonged disputes often lead to court proceedings, which are costly and time-consuming (Abdullah et al., 2023).

Second, contract terms must be drafted in clear and understandable language for the end user (Loos, 2023). Contract review aims to prevent ambiguity and misinterpretation of contract contents. Such ambiguity can lead to disputes between parties, each interpreting provisions differently. The review process clarifies and reinforces the language used, thereby avoiding multiple interpretations.

Third, contract review plays a crucial role in ensuring a balance of interests among the parties. A sound contract should reflect fairness for all involved. Review helps identify disproportionately unfavorable clauses and opens room for renegotiation or amendment to reach a fair agreement (Hesselink, 2022).

Fourth, the contract review process helps identify potential legal and commercial risks early on. As a result, parties can anticipate risks and formulate effective mitigation strategies to avoid financial and reputational losses (Davis, 2020). For example, in construction projects known for complexity, uncertainty, and high risks contracts often include exculpatory clauses to shift liability from one party to another. While such clauses are increasingly common, field practices show that they are often drafted in disproportionate ways, leading to legal uncertainty and potential conflicts. Therefore, understanding how these clauses are drafted, allocated, and legally validated is essential (Khalef et al., 2021).

Fifth, the PPK plays a strategic role in managing procurement contracts from design, signing, and implementation control to payment completion and asset handover to the state. Even when procedures are followed properly, the PPK remains legally accountable and must be audit-ready, as their authority is grounded in positive law and general principles of good governance (Utama & Irsan, 2018). According to Presidential Regulation No. 12 of 2021, any report of suspected state losses must first be submitted to internal auditors (APIP) before being escalated to law enforcement. In practice, however, many PPKs are summoned directly by authorities without following this procedure, causing insecurity and disrupting their professionalism when dealing with vendors. Therefore, there is an urgent need to ensure proper legal protection for PPKs, enabling them to perform their duties without fear as long as they comply with the rules (Metasari, 2022). Accordingly, contract review is a critical and strategic step to ensure that contracts meet legal standards, protect all parties' interests fairly, and reduce future legal and business risks.

Unlike previous studies that focused on theoretical aspects of contracts (Abdullah et al., 2023; Agung & Putra, 2025) or the role of legal professionals in the digital age (Afdhal, 2024; Gravett, 2020), this article provides a cutting-edge contribution by offering a practical framework for using AI as a legal analysis tool based on natural language processing and machine learning (Dikmen et al., 2025; Guida et al., 2023). Furthermore, this innovation also considers governance and legal certainty aspects in AI implementation within the public sector (Cihon et al., 2021; Greenstein, 2022; Hickok, 2024), aligning the technological approach with contractual justice and legal protection principles in the Indonesian context (Damayanti & Yudyaningrum, 2023; Hilmy Rizqullah Ramadhan et al., 2024). Thus, this paper broadens the horizon of prior research through a more practical, multidisciplinary, and contextual approach.

METHODS

This study employs a normative-judicial approach, which is a legal research method focused on examining written legal norms, such as legislation, legal doctrines, and relevant court decisions. This approach is used to analyze how the utilization of Artificial Intelligence (AI) can function as an assistive tool in the contract review process for government procurement of goods and services, with the aim of mitigating legal risks. The research is descriptive-analytical in nature, intended to systematically and factually describe the prevailing legal provisions related to procurement and contract oversight by government institutions, and to analyze them in relation to the application of AI technology.

Currently, there are no specific regulations in Indonesia that explicitly govern the use of AI in the contract review process for government procurement. However, several existing legal frameworks can serve as an initial legal basis to support the implementation of such technology. First, the Law on Electronic Information and Transactions (ITE Law) recognizes the use of electronic systems in governmental and public service activities, which can serve as a foundational basis for the legal use of AI. Second, the Law on Government Administration emphasizes the principles of prudence and accountability for public officials, implying that even with AI assistance, legal responsibility remains with the officials. Third, the Presidential Regulation on Government Procurement of Goods and Services underscores the principles of transparency, efficiency, and accountability, and allows space for information technology innovations in the procurement process. Fourth, regulations issued by the National Public Procurement Agency (LKPP) govern the use of electronic systems in the provider selection process, though they do not yet address automated legal analysis—hence, normative strengthening is still required to ensure that AI use remains within legal boundaries. Lastly, the Circular Letter from the Ministry of Communication and Information (Kominfo) on AI Ethics outlines ethical principles for AI use, such as accountability, security, and data protection. Although not legally binding, this serves as an initial normative reference for the ethical development and implementation of AI in the public sector.

RESULT AND DISCUSSION

According to Gustav Radbruch (Mahfud, 2024), the law must embody three fundamental values: justice, legal certainty, and utility. In the context of government procurement of goods and services, the value of justice demands that all contractual clauses be designed and reviewed to protect the interests of both parties in a balanced manner. This justice cannot be achieved without a careful contract review mechanism. The use of Artificial Intelligence (AI) as a tool in contract review must therefore be assessed from the perspective of these legal values whether AI can realize substantive justice in contractual practice or whether it risks obscuring legal responsibilities among the parties involved.

Hans Kelsen, through his Pure Theory of Law, argues that the law is a system of norms that must be logical and consistent (Asshiddiqie & Safa'at, 2006). With the increasing use of AI in legal analysis, a new challenge arises in maintaining the logical consistency of the legal system. AI as a technology must operate based on valid legal input and must not contradict the principle of legality. Therefore, it is essential to frame the use of AI within a legal structure that ensures all decisions produced remain within the boundaries of applicable legal norms.

In the implementation of AI in reviewing government procurement contracts, the principle of legality becomes a fundamental element that must be upheld. According to Lon L. Fuller (Greenstein, 2022), the law is not merely a set of formal rules but must also fulfill eight principles of the internal morality of law such as clarity, consistency, and enforceability in order to function effectively in public life. This principle is relevant when AI is used as a legal decision-making tool: the systems must be capable of explaining the reasoning behind their decisions, align with applicable legal norms, and be subject to accountability. Thus, legality in the context of AI is not only about formal compliance with rules but also includes ethical and functional aspects of the legal system. The use of AI in public administration must be supported by a legal framework that enables oversight of the technology and ensures its use does not shift the legal responsibilities of authorized public officials.

Contract Review with AI

Government procurement of goods and services is a crucial component of public administration that requires a high degree of legal certainty and accountability. This process is integral to government operations, as it involves substantial financial resources and has significant impacts on national development (Hartanto et al., 2024). However, procurement processes are often vulnerable to corruption, collusion, and nepotism, which can undermine their effectiveness and efficiency (Paulus Maturbongs & Muh Sofyan Achmad Ruslan Syamsuddin Muchtar, 2018). In 2021, the allocation for procurement accounted for 52.1% of Indonesia's national budget (APBN), equivalent to IDR 1,214.1 trillion. This considerable portion emphasizes that every stage of the procurement process—from planning, provider selection, to contract implementation must be carried out in accordance with relevant laws and regulations, such as Law No. 1 of 2004 in conjunction with Law No. 15 of 2006, and Presidential Regulation No. 16 of 2018 in conjunction with Presidential Regulation No. 12 of 2021, while adhering to the principles of good governance.

Nevertheless, the potential for disputes in procurement remains unavoidable, particularly during qualification, contract signing, or implementation stages (Damayanti & Sri Yudyaningrum, 2023). Data from the Indonesian National Arbitration Board (BANI) shows that the construction sector accounts for the highest proportion of disputes 30.8% of total cases resolved. Research indicates that most construction-related disputes stem from non-compliance with technical standards, particularly concerning the strength and durability of buildings, as identified by technical expert assessments. These issues often result in the work being deemed a building or construction failure (Latada et al., 2022).

AI offers a solution to enhance review efficiency (Zeng et al., 2025). It enables legal professionals to improve the efficiency and effectiveness of their services using tools like predictive analytics, natural language processing (NLP), and automated document review. With this technology, lawyers can expedite legal research, predict litigation outcomes, and draft legal documents more quickly and accurately (Afdhal, 2024). In the context of contracts, AI can be directed to provide legal insights at the appropriate level of granularity (e.g., specific subsections within a clause concerning delay penalties), thereby avoiding overgeneralization or neglect of critical details. AI systems can link specific queries to the corresponding parts of the contract with the correct level of precision, making the contract review process more accurately automated. For example, questions like "Is there an international arbitration clause?" or "How is the payment scheme defined?" can be answered by the system pointing directly to the relevant section of the contract, eliminating the need to read the entire document. This accelerates the due diligence process and minimizes the risk of overlooking important contractual provisions (Faisal et al., 2024).

Experiences from Other Countries

In March 2024, the UK government, through the UK Cabinet Office, issued *Procurement Policy Note (PPN) 02/24: Improving Transparency of AI Use in Procurement*, which specifically addresses the role of AI in the public procurement process in the United Kingdom—both in the context of AI used by suppliers in preparing tenders and AI embedded in the services being offered. This document discusses regulatory and governance principles for managing the impact and transparency of AI use during the procurement of goods and services. The PPN applies to all central government departments, executive agencies, and non-departmental public bodies in the UK, and encourages them to request that service providers disclose whether they use AI (e.g., Large Language Models/LLMs) in drafting tender documents or in the services provided. It also recommends steps such as enhanced due diligence, safeguards for confidential data use, extended evaluation timelines, and close collaboration with cybersecurity teams, especially for procurements related to national security (UK Cabinet Office, 2024).

A literature study conducted by Aung et al. in the UK, focusing on the application and impact of AI in the healthcare sector, shows that AI has considerable potential to reduce healthcare professionals' workloads, improve diagnostic accuracy, and speed up clinical decision-making. However, its implementation faces significant challenges, such as data limitations, algorithmic bias, lack of empirical evidence, and ethical and accountability concerns (Aung et al., 2021).

In jurisdictions like the United States and New Zealand, AI has demonstrated strong potential to enhance the efficiency of contract review processes. Experimental studies have found that large language models (LLMs) such as GPT-4 and Claude outperformed junior lawyers and legal outsourcing

providers in reviewing ten procurement contract documents—particularly in terms of legal issue identification accuracy, speed, and cost-efficiency, achieving savings of up to 99.97%. These findings mark a significant transformation in the legal industry, especially in efforts to optimize the quality and efficiency of legal services (Martin et al., 2024).

In Morocco, the government is actively promoting AI integration in contractual processes as part of a national digital transformation strategy. This initiative includes the use of AI in drafting, executing, and resolving contract disputes, aimed at enhancing efficiency and fostering innovation. However, alongside these advances, concerns have emerged regarding legal and ethical risks—particularly around data protection, confidentiality, and the assurance of contractual rights (Houssaini & Bensmail, 2023).

Research by Kwan et al. compares AI and machine learning regulatory approaches in China, the United States, and the European Union, revealing differences in state roles, market frameworks, and individual rights protections. China enforces strict regulations to ensure security and promote domestic industry; the U.S. prioritizes innovation through non-binding principles; while the EU adopts a legally binding AI Act focused on fundamental rights protection through a risk-based approach. While all three jurisdictions agree on the importance of safe and responsible regulation, these divergent approaches may pose global challenges in terms of trade, jurisdiction, and harmonizing international standards (Kwan et al., 2024).

In the European Union, particularly in Spain, the use of AI in public procurement demonstrates significant potential to enhance efficiency and accuracy. AI technologies have been applied across various procurement phases, including contract planning, determining Common Procurement Vocabulary (CPV), chatbot support, and early detection of corruption practices through systems such as ARACHNE. Nonetheless, the deployment of AI in public procurement introduces substantial legal and ethical risks—particularly concerning the lack of algorithmic transparency (the "black box" problem), the potential for discriminatory automated decisions, and weak accountability mechanisms. To ensure compliance with good governance principles, explainability, human oversight, and auditability must be guaranteed at every stage of AI implementation. Accordingly, strong legal frameworks, effective human supervision, and robust data governance policies are essential (Miranzo Díaz, 2023).

Legal Framework Issues

The use of AI in government procurement of goods and services must adhere to the principles set forth in Presidential Regulation No. 16 of 2018 in conjunction with Presidential Regulation No. 12 of 2021. These regulations emphasize efficiency, transparency, and accountability as fundamental pillars of good governance. However, there are currently no provisions that explicitly regulate the use of automated systems or AI in legal auditing or contract review within procurement processes. To ensure that AI usage does not conflict with the principles of administrative law or shift legal responsibility away from public officials, clear regulations are needed to define the scope, limits of authority, and accountability mechanisms for AI implementation in each stage of procurement.

In Indonesia, the main challenge in applying AI to contract review lies in the aspect of legal certainty (Hilmy Rizqullah Ramadhan et al., 2024). Indonesian civil law, particularly the Civil Code (KUHPerdata), does not explicitly recognize AI-generated contract analysis as a legally binding reference. The Civil Code and related regulations require explicit agreements between parties and interpretations based on the real intentions of those parties (Agung & Putra, 2025). Moreover, Indonesian law has yet to clearly determine who bears responsibility for errors resulting from AI-generated outputs (Maruli Tua Situmeang et al., 2025). This raises legal questions about the status of AI-generated contract reviews in cases of disputes or conflicting interpretations (Indarto, 2024).

AI development in Indonesia has entered various strategic sectors, such as the creative industry, healthcare, education, and public services. While the technology holds great potential for improving efficiency and fostering innovation, it also introduces ethical, social, and legal challenges that must not be overlooked. However, the legal framework governing AI use in Indonesia is still in its early stages and does not yet provide comprehensive legal certainty—particularly regarding its application in public sectors such as procurement. As of now, there is no legislation specifically regulating AI utilization in legal practice, including contract review. The only existing normative instrument is the Circular Letter of the Minister of Communication and Informatics No. 9 of 2023 concerning AI Ethics (SE 9/2023).

SE 9/2023 provides guidance for business actors and electronic system operators in formulating and implementing internal policies and programming activities based on ethical and responsible AI. The circular emphasizes the importance of applying ethical principles throughout the entire lifecycle of AI technology—from research and development to public use. Key principles include inclusivity, humanity, security, accessibility, transparency, accountability, personal data protection, environmental sustainability, and intellectual property rights protection. Moreover, the circular stresses that AI should not replace human decision-making in matters involving human values and must remain within the bounds of existing legal frameworks. Therefore, oversight and education for developers and the general public are integral to ensuring that AI adoption aligns with national and public interests. However, since SE 9/2023 is not legally binding, it functions more as an ethical guideline than a legal mandate—highlighting the gap between technological advancement and the readiness of Indonesia's legal system to accommodate AI as a contributor in public-sector legal decision making.

In practice, SE 9/2023 assigns clear responsibilities to business actors and system providers to develop internal codes of ethics, conduct public education programs, and ensure that AI is used safely, non-discriminatorily, and without causing harm to individuals or groups. The government also plays a supervisory role in preventing technology misuse and acts as a facilitator in developing human resource capacity that understands both the technical and social aspects of AI. Hence, AI ethics is not merely a normative issue but a key component in building a fair, inclusive, and sustainable digital ecosystem.

Within legal theory, the principle of legality serves as a fundamental normative basis for ensuring legal certainty and the protection of individual rights. This principle holds that no act may be punished without pre-existing legal provisions (*nullum crimen sine lege*). As Hans Kelsen emphasized in his Pure Theory of Law, the validity of a legal norm depends on its hierarchical position within the normative system (Kelsen, 1967). In this context, the legality principle functions as an evaluative benchmark for the legitimacy of legal actions and ensures that all forms of regulation and enforcement are always subject to valid legal principles (Simons, 2012).

Governance Issues

In addition to accountability, the principle of transparency presents a significant challenge in the governance of AI utilization. In the context of government procurement of goods and services, transparency is a foundational element for preventing corruption and collusion. Therefore, any technology used including AI must be designed in such a way that its analysis results and decision-making processes can be justified to the public, including audit institutions and law enforcement agencies (Hickok, 2024). Unfortunately, there is currently no external oversight mechanism that can audit decisions made by AI systems, especially when such systems are developed by third parties or use proprietary software with closed-source code.

The ethical and effective procurement of AI systems heavily depends on the involvement of AI experts during the evaluation process. Determining which type of AI should be used and filling in the required technical checklist can only be done by individuals who understand the context and mechanics of the technology. Research in several countries—including Canada, Brazil, and Singapore—reveals regulatory gaps in AI procurement, such as exemptions for in-house development or low-value projects, which may allow high-risk AI systems to bypass evaluation. Therefore, both substantive and procedural transparency must be ensured, along with stronger involvement of external experts and harmonization of AI audit standards, to guarantee that AI systems adopted by governments align with public values and principles of responsible governance (Zick et al., 2024).

The application of Artificial Intelligence in reviewing government procurement contracts raises serious governance challenges, particularly regarding the principle of accountability. AI as a legal decision-support tool must operate within a system that ensures every recommendation or analysis is traceable. In practice, many AI models function as a "black box," generating outputs without transparent or verifiable explanations (Yigitcanlar et al., 2023). When AI recommends removing, adding, or interpreting specific contract clauses, a good governance system must be able to answer: who is responsible for the decision? Without such clarity, the risks of moral hazard and lack of accountability will increase.

AI governance in the public sector also requires institutional policies that support human capacity development. Many procurement officers or Commitment-Making Officials (PPK) still lack a

deep understanding of how AI systems work, including their limitations and associated risks. Without proper training and clear internal regulations, AI adoption may lead to misuse or over-reliance on the technology (Zhao & Gómez Fariñas, 2023). Therefore, good governance must include the establishment of internal oversight units, continuous training, and periodic reporting and evaluation systems to assess AI performance in procurement processes. Without these elements, AI implementation in procurement risks becoming a new problem rather than a solution.

The use of AI in reviewing procurement contracts requires comprehensive policy intervention to address emerging legal and governance challenges. The government must urgently develop regulations as a legal framework that specifically governs the use of AI in administrative legal practices, including contract legal review processes. These regulations should clearly define legal responsibilities for AI-generated analyses, the scope and limits of automated systems, and accountability and oversight mechanisms that can be legally and publicly justified. Furthermore, the regulations must align with good governance principles such as transparency, efficiency, and fairness (Maragno et al., 2023).

Additionally, a dedicated oversight body or internal unit should be established to assess the performance and accuracy of AI in the procurement sector. This body would be responsible for conducting periodic evaluations, providing training to public officials, and setting ethical and technical standards for AI use. Other policy implications include the need for synergy between policymakers, technology developers, and legal practitioners to ensure that AI innovation can be adopted without compromising legal values or human rights protections (Parycek et al., 2024). With adaptive and responsive policy support, AI can become an effective instrument of bureaucratic reform, helping to establish a more accountable and trustworthy procurement system.

Legal risk mitigation in government procurement can be optimized through the integration of artificial intelligence (AI) technologies, particularly those based on Natural Language Processing (NLP), into contract management systems and internal oversight mechanisms of public institutions. This integration involves five strategic stages.

First, all contract documents must be digitized and standardized into a structured text format. Contracts previously in printed form need to be converted into electronic documents so they can be read and analyzed by AI systems. In addition, standardizing the contract structure is essential to ensure that AI can consistently recognize legal elements such as penalty clauses, arbitration, payments, contract duration, and legal liabilities (Kovtonuik, 2023).

The second stage involves applying NLP technology to extract critical clauses from the contracts. NLP is capable of reading and identifying risky provisions, such as clauses that do not comply with Presidential Regulation No. 12/2021, imbalanced exculpatory clauses, or ambiguous language that could lead to multiple interpretations (Moon et al., 2022; Siino et al., 2025b). This technology can also compare contract content against applicable regulations and government contract standards.

Next, in the third stage, AI can be employed to conduct automated legal risk assessments. Based on jurisprudence data, previous contracts, and statutory provisions, AI can flag sections of the contract that pose potential legal risks such as payment terms misaligned with project milestones or durations that exceed the fiscal year and suggest appropriate wording revisions (Dabass & Dabass, 2018).

The fourth stage is the implementation of audit trails and transparent accountability mechanisms. Every recommendation generated by AI must be systematically documented in an audit trail that details the reasoning process, legal sources used for reference, and the identity of the user who approved the system's output (Cihon et al., 2021). This ensures that AI functions solely as an analytical tool and not as a substitute for decision-making authority.

Finally, legal accountability remains with the authorized public officials. With a proper audit system and comprehensive documentation, AI-generated outputs can be accounted for before auditors and law enforcement agencies (Zuiderwijk et al., 2021). This approach enables the transparent, accountable, and legally compliant deployment of AI in accordance with the principles of administrative law.

Legal Risk Mitigation Through the Integration of AI into Contract Management and Internal Oversight Systems of Government Institutions

Legal risk mitigation in government procurement of goods and services can be optimized through the integration of Artificial Intelligence (AI) technology—particularly those based on Natural

Language Processing (NLP)—into the contract management and internal oversight systems of government institutions. This integration involves five strategic stages. First, all contract documents must be digitized and standardized into structured text formats. Contracts that were previously in print must be converted into electronic documents so that they can be read and analyzed by the system. Additionally, standardizing the structure and content of contracts is essential to ensure that AI can consistently recognize legal elements such as penalty clauses, arbitration, payment terms, contract duration, and legal responsibilities (Kovtonuik, 2023).

The second stage involves the application of NLP technology to extract critical clauses within contracts. NLP is capable of reading and identifying high-risk provisions, such as clauses that conflict with the provisions of Presidential Regulation No. 12/2021, imbalanced exculpatory clauses, or ambiguous phrases prone to multiple interpretations (Moon et al., 2022; Siino et al., 2025b). This technology can also be used to compare the contents of a contract against current regulations and standard government agreement templates. The third stage involves the use of AI for automated legal risk analysis. Drawing on jurisprudence data, prior contracts, and existing legal provisions, AI can flag clauses that potentially pose legal risks such as misaligned payment terms or timeframes that exceed budget periods and provide recommended alternative wording (Dabass & Dabass, 2018).

The fourth stage is the implementation of audit trails and transparent accountability mechanisms. Each recommendation generated by the AI must be systematically documented in an audit trail that outlines the system's reasoning, the legal sources referenced, and the identity of the user who approved the AI's recommendation (Cihon et al., 2021). This ensures that AI functions solely as an analytical tool and not as a substitute for human decision-making authority. Ultimately, legal responsibility must remain with the authorized public official. With adequate audit systems and complete documentation, the outcomes produced by AI can be held accountable before auditors or law enforcement authorities (Zuiderwijk et al., 2021). This approach enables the deployment of AI in a transparent, accountable manner that aligns with the principles of administrative law.

The following is an example of the use of artificial intelligence as a supporting tool for contract review in government procurement of goods and services to mitigate legal risks

Table 1. Utilization of Artificial Intelligence as a Supporting Tool for Contract Review in Government Procurement of Goods and Services to Mitigate Legal Risks

No	Aspects Reviewed by AI	AI Findings Description	Potential Legal Risks Detected	Recommended Mitigation Actions
1	Legal Obligation Clause	There is a multi-interpretable clause regarding the time period for completing the work.	Contractual disputes due to differences in interpretation.	Revise the clause with more precise diction and refer to the standards of Presidential Decree No. 16 of 2018.
2	Regulatory Compliance	There were discrepancies with LKPP provisions regarding TKDN.	Potential administrative violation.	Adjustment of the contract wording to comply with the provisions of the Minister of Industry Regulation.
3	Sanctions and Force Majeure	The clause does not contain provisions regarding force majeure.	Legal risks in the event of an extraordinary event (e.g. disaster).	Addition of force majeure clause in accordance with international practice and national law.
4	Identify Potential Fraud	AI flags recurring contract patterns from the same provider without justification.	Risk of conflict of interest or indications of corruption, collusion and nepotism.	Audit and clarification of the goods/services provider selection process.
5	Contract Format and Structure	The contract structure does not comply with the LKPP template standards.	Risk of invalidity or inconsistency in contract interpretation.	Document adjustments using the standard format from LKPP.

The table on the use of artificial intelligence in the review of government procurement contracts demonstrates that AI technology plays a crucial role in identifying potential legal risks from the early stages of contract drafting. These findings reveal that government contracts often contain hidden risks that are difficult to detect manually. With Natural Language Processing (NLP) capabilities, AI can comprehensively scan documents and provide recommendations based on applicable regulations, such as Presidential Regulation No. 16 of 2018 and provisions issued by the National Public Procurement Agency (LKPP). The recommendations generated by AI include editorial revisions, the addition of critical clauses, and adjustments to align with official templates issued by relevant agencies.

Thus, AI functions not only as an error detection tool but also as a proactive legal risk mitigation instrument. Its use in this context supports the principles of efficiency, accountability, and legal compliance in government procurement processes, while also helping to prevent potential state losses resulting from contractual disputes or administrative violations.

CONCLUSION

The utilization of Artificial Intelligence (AI) in reviewing government procurement contracts presents significant opportunities to enhance the efficiency, accuracy, and accountability of the procurement process. Technologies such as Natural Language Processing (NLP) enable automated analysis of contract clauses, the detection of potential legal risks, and the generation of data- and regulation-based recommendations. Through document digitization, standardized contract formats, and systems that record and explain each AI-generated decision via audit trails, the review process becomes more objective and well-documented. This offers additional legal protection for Commitment-Making Officials (PPK) and reduces the likelihood of administrative negligence.

Nevertheless, the implementation of AI in public procurement requires a clear and adaptive legal and governance framework. Specific regulations must be developed to define the limits of AI systems' authority, clarify legal responsibilities for AI-generated outputs, and establish internal oversight mechanisms to prevent the emergence of new legal issues. In addition, collaboration among regulators, technology developers, and procurement practitioners is essential to ensure that AI adoption aligns with good governance principles such as transparency, efficiency, fairness, and accountability. With a holistic and legally grounded approach, AI can serve as an effective and integrity-driven tool for reforming government procurement practices.

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