

Research on the application status, problems and improvement paths of artificial intelligence in the field of legislation

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Abstract. In recent years, information technologies such as Artificial Intelligence (AI) and big data have achieved continuous development and gradually penetrated multiple areas of national governance, with legislative work also subject to the impacts of this trend. Compared with the traditional legislative model that mainly relies on manual processing of legal materials and social information, artificial intelligence can boost work efficiency in links including legal retrieval, drafting of regulatory drafts, filing and review, and legislative evaluation, while offering new possibilities for the digitalization of legislative work. Accordingly, AI-assisted legislation has gradually become a key research topic attracting attention from domestic legal academia in recent years. Centering on this issue, this paper sorts out the applications of artificial intelligence in the links of legislative preparation, legislation formulation and legislative implementation by combining relevant domestic research and local legislative practices in China, and analyzes its functions in raising legislative efficiency, supporting legislative decision-making and facilitating public participation. Meanwhile, this paper discusses practical dilemmas faced by artificial intelligence in legislative practices, covering data security, algorithm transparency, legal liability and ethical governance. This paper holds that the advancement of artificial intelligence provides new technical support for the modernization of China's legislation, yet it will not alter the basic principles governing legislative work. In the future, artificial intelligence shall remain positioned as an auxiliary tool for legislation. While giving full play to its technical strengths, we shall adhere to human-led governance, continuously refine relevant institutional and governance mechanisms, and ensure technological development always serves the construction of the rule of law.

Keywords: artificial intelligence, AI-assisted legislation, local legislation, digital rule of law, legal regulation

1. Introduction

1.1. Research background

The rapid advancement of artificial intelligence technology in recent years has driven its gradual application in various sectors including healthcare, education and finance, with legislative work also affected by this trend. In contrast to the traditional legislative model dependent on manual handling of legal documents and social

information, artificial intelligence can enhance efficiency in legal retrieval, regulatory draft drafting, filing review, legislative evaluation and other procedures, delivering new technical backing for the digital development of legislative work.

The gradual integration of artificial intelligence into the legislative field is not an accidental phenomenon, but a product of the continuous development of legal informatization. With the sustained accumulation of legal data and the advancement of legal informatization construction, artificial intelligence has gradually acquired the technical foundation to engage in auxiliary legislative work and become a vital component of digital rule of law development [1].

At the same time, legislative work itself is confronted with new challenges. As economic and social development expands the scope of legal adjustment, legislative bodies are required to process an ever-growing volume of information, making traditional working methods increasingly inadequate to meet practical demands. Qian pointed out that legislative decision-making is subject to dual constraints of bounded rationality and information overload. Legislators can hardly complete the analysis and judgment of massive information within limited time, so leveraging artificial intelligence to improve legislative efficiency has emerged as an important exploration in current legislative practices [2].

In recent years, regions including Tianjin and Shanghai have launched trials of applying artificial intelligence to legislative practices and attained certain outcomes. Nevertheless, this does not mean artificial intelligence can resolve all problems in legislation. As artificial intelligence increasingly participates in legislative activities, issues such as algorithm transparency, data security, legal liability and ethical governance have drawn mounting attention. As Song noted, artificial intelligence can only perform auxiliary functions; rule-making shall remain human-led to avoid overreliance on algorithmic decisions [3].

Therefore, after artificial intelligence enters the legislative sphere, the core question worthy of reflection is no longer whether it can participate in legislation, but how to rationally harness the strengths of artificial intelligence amid continuous technological advancement while safeguarding the scientificity, impartiality and democracy of legislative work. This is also the core question to be further discussed in this paper.

1.2. Research purpose and significance

Taking the development status of AI-assisted legislation in China as the research object, this paper sorts out relevant domestic research and combines local legislative practices in China to analyze specific applications of artificial intelligence in legislative preparation, legislation formulation, legislative implementation and other links, and further explore its roles in boosting legislative efficiency, supporting legislative decision-making and promoting public participation.

Meanwhile, this paper intends to analyze the major practical dilemmas of AI-assisted legislation based on existing research and discuss corresponding improvement paths. By organizing existing research findings and practical experience, this paper aims to offer references for deeper understanding of artificial intelligence's role in legislation and enrich comprehension of shifts in legislative models under the backdrop of digital rule of law.

2. Literature review

Against the backdrop of artificial intelligence's gradual application in public governance, domestic research on AI-assisted legislation has proliferated in recent years. Existing studies mainly discuss the background, specific applications, practical value and potential risks of artificial intelligence's integration into legislation, forming a relatively complete research framework. However, scholars hold divergent focal points, and

disagreements persist regarding artificial intelligence's role positioning and future development directions in legislation.

2.1. Research on the background of artificial intelligence's integration into legislation

Existing studies generally agree that artificial intelligence's entry into the legislative field stems from both advances in information technology and inherent evolving demands of legislative work.

From the perspective of technological development, Gao Shaolin argued that the continuous accumulation of legal data and advancement of legal informatization construction have equipped artificial intelligence with the technical foundation to undertake auxiliary legislative tasks, making it a core component of digital rule of law construction [1]. This demonstrates that artificial intelligence's entry into legislation is not coincidental, but a natural outcome of advancing legal informatization.

Nevertheless, technological progress alone cannot fully explain why artificial intelligence has been introduced into legislative practices. Qian Dajun pointed out that economic and social expansion has multiplied the information processing burdens of legislative bodies, rendering traditional manual information sorting and analysis increasingly incapable of matching practical needs. Constrained by bounded rationality and information overload, harnessing artificial intelligence to elevate information processing efficiency and support legislative decision-making has become a new exploratory direction [2].

Synthesizing existing research, artificial intelligence's integration into legislation is driven by both technological progress and practical demands of legislative work. Legal informatization provides the technical foundation for AI application, while mounting information processing pressures within legislative work further accelerate artificial intelligence's adoption in the legislative field.

2.2. Research on specific applications of artificial intelligence in legislation

Existing research confirms that artificial intelligence has gradually penetrated multiple links of legislative work, yet its core functions vary across different stages. At present, artificial intelligence primarily undertakes information processing and auxiliary analytical tasks, while core decision-making involving value judgments remains the exclusive purview of legislative bodies.

This feature is most prominent in the legislative preparation phase. Liu argued that relying on big data analytics and natural language processing technologies, artificial intelligence can rapidly complete legal information retrieval, case analysis and data sorting, thereby elevating information processing efficiency in early-stage legislative work [4].

In the legislation formulation phase, artificial intelligence participates in auxiliary draft generation, textual analysis and public opinion collation. Jiang noted that artificial intelligence can assist local legislative bodies in document retrieval, project argumentation and draft revision, standardizing legislative procedures and raising overall work efficiency [5].

Compared with the previous two phases, the legislative implementation phase centers on post-promulgation regulatory administration. At present, intelligent systems have been deployed in regions to conduct filing reviews and regulatory clean-ups. By matching keywords and comparing databases, these systems enhance the efficiency and accuracy of normative document reviews [1].

It can be concluded that artificial intelligence now covers multiple segments of legislative work, yet it merely transforms operational modes rather than legislative decision-making mechanisms themselves. Thus, artificial intelligence remains an auxiliary tool rather than a legislative subject at this stage.

2.3. Research on the value of AI-assisted legislation

Existing studies identify three core values of artificial intelligence in legislation: efficiency improvement, support for scientific decision-making and facilitation of public participation.

The most direct benefit lies in boosted work efficiency. Artificial intelligence can rapidly complete repetitive tasks including legal retrieval, document sorting and information analysis, reducing the workload of legislative staff and raising overall operational efficiency.

Beyond efficiency, some scholars argue that artificial intelligence can supply comprehensive reference materials for legislative bodies through data analysis and model computation, aligning legislative decisions with social realities and enhancing the scientific nature of legislative work [6].

Meanwhile, advances in artificial intelligence have reshaped channels for public participation in legislation. Supported by online platforms and data processing technologies, artificial intelligence can collect and categorize public opinions more efficiently, integrating diverse social voices into legislative procedures and strengthening the openness and democracy of legislative work.

It should be emphasized that Song maintained that regardless of technological advances, artificial intelligence shall remain confined to auxiliary roles and shall not replace legislative subjects to make value judgments [3]. Therefore, artificial intelligence only improves the efficiency and capacity of legislative work, rather than stripping legislative bodies of their decision-making authority.

2.4. Research on risks of AI-assisted legislation

As artificial intelligence gains deeper involvement in legislative work, an increasing number of scholars have begun to examine its potential risks. Existing studies categorize these risks into three dimensions: technical, legal and ethical.

On the technical front, artificial intelligence operates dependent on data and algorithms, yet real-world data suffers from inconsistent quality, alongside algorithmic "black box" issues and model biases that distort the accuracy of analytical outputs.

More noteworthy than technical defects are legal controversies. When artificial intelligence screens information or generates auxiliary recommendations, liability attribution for biased system outputs—whether borne by system developers, users or legislative bodies—lacks clear legal definition to date [7].

Furthermore, multiple studies have identified additional risks including excessive data collection, algorithmic discrimination and opaque decision-making procedures, which risk eroding public trust in legislative work [8].

It follows that dilemmas confronting AI-assisted legislation stem not only from technological limitations but also from institutional and governance frameworks. Balancing enhanced legislative efficiency with adherence to the rule of law and procedural legitimacy remains a core focus of current research.

3. Current application status of AI-assisted legislation in China

Driven by continuous digital government construction and artificial intelligence technological advances, China has gradually deployed artificial intelligence in legislative practices, with local legislative bodies launching targeted explorations of intelligent auxiliary legislative systems. Despite the overall nascent stage and uneven development across regions, these practical trials have laid a realistic foundation for artificial intelligence's participation in legislation. This section analyzes AI legislative applications by reviewing specific domestic practices.

3.1. Practical explorations of AI-assisted legislation

Regions including Shanghai, Tianjin and Beijing have piloted artificial intelligence in legislative practices and developed intelligent legislative platforms and digital legislative systems. These platforms primarily undertake legislative document sorting, regulatory inquiry and normative document management, delivering moderate efficiency gains to legislative work [1, 5].

Beyond local legislative organs, the National People's Congress and regional NPC systems have continuously advanced electronic filing and information-based review mechanisms in recent years, integrating artificial intelligence and big data technologies into foundational legislative workflow links [9]. These practices demonstrate that artificial intelligence has begun to replace traditional manual information processing and drive the digital transformation of legislative work. At present, AI applications remain concentrated on foundational tasks, and its long-term impacts on legislative work await further observation.

3.2. Specific applications of artificial intelligence in legislative procedures

Current practices reveal artificial intelligence's penetration across multiple legislative links, with differentiated core functions across distinct stages. Rather than directly engaging in legislative decision-making, artificial intelligence focuses primarily on information processing and auxiliary analytical tasks, which constitute the dominant field of its present application.

This characteristic stands out prominently in the legislative preparation phase. Legal information retrieval, case analysis and data sorting are highly repetitive tasks that artificial intelligence can complete at scale, mitigating the information processing burden on legislative staff and elevating pre-legislation efficiency.

In the legislation formulation phase, artificial intelligence assists in auxiliary draft generation, textual comparison and public opinion categorization. For instance, automated cross-comparison of different regulatory draft versions minimizes omissions arising from manual revisions; simultaneous classification of public feedback accelerates legislative bodies' handling of public input.

Compared with the preceding two phases, the legislative implementation phase centers on post-promulgation regulatory governance. Artificial intelligence is primarily deployed for filing review, regulatory clean-up and post-implementation evaluation. Through database matching and keyword recognition, it identifies conflicts and redundancies among normative documents to improve review comprehensiveness.

Across the full legislative workflow, artificial intelligence covers multiple operational links yet only transforms legislative operational modes without altering core decision-making mechanisms. All core matters involving interest balancing and value judgment ultimately require rulings from legislative bodies.

3.3. General characteristics of AI-assisted legislation

Synthesizing existing practical experiences, China's AI-assisted legislation has achieved initial progress yet remains in an exploratory stage with uneven development across regions.

In terms of deployment, artificial intelligence applications are concentrated in economically developed regions with robust information infrastructure, limited to foundational tasks including legal information retrieval, document sorting and normative document administration. Core work involving legislative value judgment and interest trade-offs remains fully reliant on legislative bodies. This indicates that artificial intelligence merely boosts operational efficiency without overhauling the fundamental model of legislative work.

With ongoing digital government construction, the scope of artificial intelligence's legislative applications is poised for further expansion [10]. Nevertheless, more critical than expanding application coverage is establishing stable, rational collaborative relationships between artificial intelligence and existing legislative

mechanisms under the premise of safeguarding legislative subjects' dominant status. This constitutes a key developmental direction for future AI-assisted legislation.

4. Dilemmas and improvement paths of AI-assisted legislation

As analyzed above, artificial intelligence delivers positive effects in boosting information processing efficiency and supporting legislative work, advancing the digital transformation of legislative practices. However, its application in legislation remains immature. Deepening AI integration into legislative procedures has exposed a series of inherent dilemmas that constrain artificial intelligence's full functional potential.

4.1. Dilemmas confronting AI-assisted legislation

Current practical deployments reveal three interrelated, mutually restrictive dimensions of dilemmas plaguing AI-assisted legislation: technical, legal and governance challenges.

First, technical limitations constitute the foundational barrier to AI-assisted legislation. Artificial intelligence's operation relies entirely on data and algorithms, yet fragmented data sources and inconsistent data standards compromise the reliability of analytical outputs. Additionally, the "black box" nature of many algorithms prevents legislative staff from grasping the logical basis of system-generated analyses, undermining artificial intelligence's credibility in legislative practices [8]. While artificial intelligence accelerates information processing, it cannot guarantee fully accurate and reliable analytical results.

More urgent than technical defects is the ambiguous legal positioning of artificial intelligence in legislation. Although artificial intelligence is universally recognized as a mere auxiliary tool, its growing participation in information screening, textual analysis and auxiliary recommendation generation blurs the boundary between technical support and legislative decision-making. No clear legal provisions currently define liability allocation for biased system outputs, whether borne by system developers, operators or legislative bodies [7]. Thus, artificial intelligence's development generates not only technical shifts but also new demands for reforming existing legal institutions.

Furthermore, artificial intelligence's application raises governance and ethical concerns, including excessive personal data collection, algorithmic bias and opaque decision-making procedures. These risks threaten personal information security and risk eroding public trust in legislative work. Absent effective supervision, technological advantages may conversely undermine the impartiality and public credibility of legislative work.

The above analysis demonstrates that dilemmas of AI-assisted legislation stem not merely from immature technology, but more critically from incomplete supporting institutional construction. Only coordinated advancement of technology and institutional frameworks can unlock artificial intelligence's full potential in legislative work.

4.2. Improvement paths for AI-assisted legislation

Addressing the aforementioned dilemmas requires parallel progress in technological refinement, legal institutional improvement and governance mechanism optimization. Coordinated technological innovation and institutional construction are prerequisites for stable, standardized AI deployment in legislative practices.

First, artificial intelligence's role positioning in legislation must be clearly defined. At present, artificial intelligence is suited exclusively for auxiliary tasks including information processing and data analysis, while core decision-making involving public interest trade-offs and value judgments shall remain the sole responsibility of legislative bodies. Future legislative practices shall consistently uphold the principle of

"human leadership, machine assistance", avoid overreliance on automated algorithmic judgments, and guarantee legislative power remains vested in human legislative subjects [3].

Second, supporting legal institutions governing AI-assisted legislation must be refined. As artificial intelligence penetrates full legislative workflows, existing legal frameworks lack clear provisions governing AI's applicable scope, liability boundaries and operational norms. Clear institutional rules are required to establish stable legal foundations for artificial intelligence's participation in legislative procedures.

Third, algorithm transparency and interpretability mechanisms must be strengthened. While artificial intelligence enhances operational efficiency, legislative staff can only trust technological outputs when they fully comprehend the logical basis and operational mechanisms of system analyses. Improving algorithm transparency constitutes not merely a technical upgrade, but a critical safeguard for preserving legislative public credibility [4].

Finally, comprehensive data governance and ethical norms must be established, with strengthened supervision over data sources, data utilization and personal privacy protection. Simultaneously, algorithmic bias assessment and oversight mechanisms shall be constructed to mitigate unfair outcomes generated by technology and uphold the impartiality of legislative work [8].

In summary, advancing AI-assisted legislation entails far more than technological upgrades; it requires constructing institutional systems compatible with technological progress. Going forward, synchronized advancement of technological innovation and rule of law principles is essential to transform artificial intelligence into an effective auxiliary tool for legislation without compromising the impartiality and authority of legislative work.

5. Conclusion

This paper analyzes the application status, inherent dilemmas and targeted improvement paths of AI-assisted legislation in China. Synthesizing domestic academic research and local legislative practices, artificial intelligence has been gradually deployed across legislative preparation, legislation formulation and legislative implementation phases, generating tangible effects in legal information retrieval, regulatory draft drafting, filing review and legislative evaluation. At the current stage, artificial intelligence has demonstrated distinct advantages in boosting legislative efficiency, optimizing information processing workflows and advancing the digitalization of legislative work.

Nevertheless, artificial intelligence's application in the legislative field remains in the exploratory phase. Its core functions are confined to auxiliary information processing and decision support provision, while all core issues concerning public interests, value judgment and interest balancing ultimately require rulings from legislative bodies. Meanwhile, unresolved challenges including data quality defects, algorithm opacity, undefined legal liability and ethical governance gaps necessitate further refinement of supporting institutional and governance frameworks for AI legislative applications.

Based on comprehensive analysis, this paper concludes that artificial intelligence's development delivers new technical support for legislative work without altering the fundamental principles governing legislation. Going forward, the advancement of AI-assisted legislation shall consistently adhere to the core principle of "human leadership, machine assistance", continuously refine supporting legal institutions, strengthen algorithm supervision and data governance, and enable standardized, rational deployment of artificial intelligence in legislative practices.

For AI-assisted legislation, the pivotal question is not the scope of artificial intelligence's participation in legislative work, but how to uphold rule of law principles amid technological advancement and properly

balance technical efficiency with intrinsic legislative values. Only under this precondition can artificial intelligence better serve legislative practices in China.

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