

Application, Difficulties and Countermeasures of Artificial Intelligence in Discipline Inspection, Supervision, Review and Investigation

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Abstract: Based on the practical needs of review and investigation work, this article systematically analyzes the application scenarios and practical value of artificial intelligence in key links such as clue research and judgment, evidence review, case analysis, and document production; In-depth research and judgment of practical difficulties such as data governance, algorithm security risks, human-machine collaboration imbalance, and lagging system norms faced in the process of technology application; Finally, from the five dimensions of data system construction, algorithm risk prevention and control, human-machine mechanism optimization, system guarantee improvement, and talent team building, targeted cracking countermeasures are proposed.

Keywords: Artificial Intelligence; Review of Investigations; Human-Machine Collaboration

1. Introduction

1.1 Research Background

At present, crimes are characterized by concealment, intelligence, and cross-domain. Review and investigation are facing multiple challenges such as the prominent contradiction of "many cases and few cases", inefficient processing of massive data, insufficient accuracy of clue mining, and difficulties in new identification. At the same time, artificial intelligence technology is iterating rapidly, and the technical system centered on large language models, knowledge graphs, computer vision, and natural language processing has the natural advantages of efficiently processing unstructured data, deeply mining associated information, and intelligently identifying abnormalities.

In this context, the Commission for Discipline Inspection and the National Supervisory Commission clearly put forward the strategic

deployment of "promoting the construction of a digital discipline inspection and supervision system, and empowering supervision, discipline and law enforcement with technology". As the core support of digital discipline inspection and supervision, artificial intelligence is gradually embedded in the entire process of review and investigation, from clue acceptance to case completion, realizing subversive changes in case handling[1]. However, technological empowerment is not all smooth sailing. Problems such as data barriers, algorithm black boxes, ethical risks, and lack of systems seriously restrict the full release of artificial intelligence application efficiency. Therefore, it has important theoretical value and practical significance to systematically sort out the application logic of artificial intelligence in review and investigation, accurately identify practical difficulties, and scientifically construct coping strategies.

1.2 Research Significance

1.2.1 Theoretical significance

Based on the professional attributes of review and investigation work and the technical characteristics of artificial intelligence, this paper constructs an analysis framework of "application scenarios-practical difficulties-optimization countermeasures" to enrich the theoretical connotation of digital discipline inspection and supervision and intelligent supervision; Clarify the integration mechanism, boundary logic and responsibility division of artificial intelligence and review and investigation work, provide a systematic analysis perspective for academic research in related fields, and promote the cross-integration of discipline inspection and supervision disciplines and artificial intelligence disciplines.

1.2.2 Practical significance

Aiming at the pain points and blockages of artificial intelligence applications in review and investigation practice, put forward practical and

operable countermeasures and suggestions to help discipline inspection and supervision agencies improve case handling efficiency, strengthen precise supervision, prevent technical risks, and standardize law enforcement behavior; Effectively respond to new challenges, break the bottleneck of case handling, promote the transformation of review and investigation work from "manpower-intensive" to "technology-driven", and provide solid technical support and institutional guarantee for the discipline inspection and supervision work in the new era.

1.3 Research Status at Home and Abroad

Foreign research on artificial intelligence in the field of law enforcement and investigation started earlier. Europe and the United States rely on mature data governance and use it for property verification, procurement and financial transaction monitoring of public officials to build an intelligent anti-corruption early warning system. However, due to its legal constraints, it is difficult to adapt to my country's discipline inspection and supervision practice. Domestic academic circles have carried out research on the integration of artificial intelligence and discipline inspection and supervision, discussed application scenarios such as clue screening and evidence analysis, analyzed risks such as data islands and algorithm bias, and proposed countermeasures such as human-machine collaboration. However, the existing research is not systematic and practical enough. Most of them are single-dimensional analysis. There is a lack of systematic research on the whole process, and it is difficult to review and investigate the needs of intelligent transformation.

1.4 Research Methods and Innovations

1.4.1 Research methodology

This article adopts research methods such as literature research, case analysis, and normative analysis to systematically sort out domestic and foreign literature, policy documents, and academic achievements related to artificial intelligence, digital discipline inspection and supervision, review and investigation, and consolidate the theoretical foundation of research; Based on typical cases of artificial intelligence application by discipline inspection and supervision agencies in Zhejiang, Guangxi, Guangdong and other places, summarize the practice and refine common difficulties; Combined with laws and regulations such as the

"Rules for the Supervision and Enforcement of Disciplinary Inspection Organs" and "Supervision Law", analyze the compliance requirements of artificial intelligence applications, enhance the practicality and persuasiveness of research, and put forward suggestions.

1.4.2 Research innovations

Based on the perspective of the whole process of review and investigation, systematically sort out the application of artificial intelligence in core links such as clues, evidence, cases, and documents, and break through the fragmentation limitations of existing research; In-depth analysis of the difficulties in the five dimensions of technology, data, system, talent, and ethics, building a systematic and systematic countermeasure framework, taking into account theoretical depth and practical operability, and proposing a human-machine collaboration mechanism and algorithm risk prevention and control that adapt to discipline inspection and supervision scenarios Measures to fill the gap in the connection between existing research and practical needs.

2. Core Application Scenarios in Review and Investigation

2.1 Intelligent Research, Judgment and Screening of Clues

Clue disposal relies on manual sorting out of materials and comparison of information. The work efficiency is low, and key clues are easy to miss. Artificial intelligence comprehensively uses natural language processing, knowledge graphs, and anomaly detection algorithms to promote more intelligent, accurate and efficient clue processing [2]. One is the automatic classification and extraction of clues. In the face of multi-channel clues such as reports, Internet public opinion, audit handover, and inspection feedback, with the help of OCR identification and semantic analysis, core elements such as reporting objects, violations of discipline, and related personnel are automatically extracted, and unstructured data is converted into structured data. According to the type of violation of discipline and risk level, the clue ledger is automatically classified to generate a clue ledger, effectively shortening the clue sorting cycle, and the clue classification efficiency of some units has increased by more than 80% after application. The second is in-

depth mining of related clues. Use knowledge graphs to integrate information such as personnel social interaction, capital transactions, job changes, kinship relationships, etc., build a four-dimensional correlation map of "personnel, funds, matters, and time", dig out the internal connection between scattered clues, and identify situations such as the collusion of interests between multiple public officials and the same businessman, to realize deep digging from point to area. The third is intelligent early warning of abnormal clues. Relying on historical cases to build an abnormal behavior model, carry out dynamic monitoring of public officials' performance of duties, capital flow, and consumption travel, automatically warn high-risk behaviors such as large-scale capital movements and illegal approval projects, and promote the transformation of clue handling from passive acceptance to active discovery.

2.2 Intelligent Review and Fixation of Evidence Evidence is the Core of a Case

The review and investigation covers multiple evidences such as documentary evidence, electronic data, and audio-visual materials. Manual review is prone to problems such as evidence omission and insufficient relevance. With the help of computer vision, recognition, and data comparison, artificial intelligence realizes the standardized operation of evidence review. First, intelligent extraction and analysis of electronic data. For electronic carriers such as mobile phones and hard disks, use trace extraction and data recovery technology to capture chat records, transfer vouchers and other materials, identify the code words of interest transfer in chat records, compare and lock abnormal transactions, and solve the problem of electronic data forensics and analysis. Second, intelligent processing of audio-visual materials. Transcribe conversation recordings and surveillance videos, mark keywords, and intercept key images, quickly extract key information such as violations of discipline and the amount involved in the conversation, and greatly reduce the review time of audio-visual materials. AI only takes 2 hours for some complex case recording materials. It can complete 10 days of manual workload. Third, intelligent verification and completion of the evidence chain. Establish a verification model according to the evidence rules, compare the legality, relevance, and consistency of various

types of evidence, timely discover evidence flaws such as contradictions between testimony and flow, lack of documentary evidence signatures, etc., prompt the direction of supplementary evidence, and help form a closed and complete evidence chain. Consolidate the basis of the case.

2.3 Intelligent Analysis and Judgment of Cases

The research and judgment of the case mainly relies on the case handlers, which are easily limited by subjective cognition, and it is difficult to fully grasp complex cases. Artificial intelligence relies on big data, knowledge graphs, and push of similar cases to improve the scientific level of case research and judgment. First, build a three-dimensional clean government portrait of the persons involved in the case. Collect the resumes, family assets, social networks, and integrity records of the persons involved in the case, describe the trajectory of power operation and the network of interest relations, identify the risk points of integrity, and provide support for breakthroughs in conversations and the formulation of case-handling strategies. Second, intelligent tracking of capital flow. Collect data such as bank statements, changes in real estate equity, wealth management transactions, etc., draw fund flow charts, completely restore the whole process of fund sources, transfers, and whereabouts, identify hidden methods such as entrusted holdings, full-amount split transfers, and solve fund verification and tracking. Difficult, the reality that the chain is easy to break. Third, intelligent push reference for similar cases. Relying on the case database, compare the types of violations and behavioral characteristics of current cases and historical cases, automatically push similar cases, qualitative and disciplinary standards, and key points of case handling, unify case handling standards, and promote the standardization of case handling.

2.4 Intelligent Generation and Verification of Legal Documents

The types of review and investigation documents are complicated, and manual writing is prone to problems such as omissions in format and improper citation of laws and regulations. Artificial intelligence realizes efficient and standardized document production through template matching, natural language generation,

and legal article association. One is the automatic generation of the first draft of the document. Establish a standardized document template library, enter core information such as those involved in the case, disciplinary facts, and evidence, and the system automatically fills in the content to generate the first draft, which can efficiently sort out conversation transcripts, review investigation reports, and document writing labor costs. The second is intelligent verification of document content. Check for problems such as text errors, logical contradictions, and improper punishment ranges in accordance with relevant laws and regulations and format specifications, and the probability of document flaws. The third is the intelligent matching and citation of laws and regulations. Combined with the facts of violations of discipline in the case, automatically match the "Regulations on Disciplinary Actions", "Supervision Law", "Criminal Law" and other provisions, and simultaneously mark the interpretation and application points of the law to ensure that the qualitative and disciplinary aspects of the case are legal and compliant.

2.5 Talking Breakthrough Intelligent Assistance

Conversations are a key link in the review and investigation. Conversations are highly dependent on case handlers, and there are uncertainties. Artificial intelligence provides assistance for conversational work from degree to degree. Carry out psychological analysis of interviewees, integrate personal background, family situation, and integrity risks, combined with real-time information such as tone and demeanor during the conversation, study and judge the psychological state of interviewees such as resistance, fluke, and wavering, and remind investigators of the rhythm of the conversation. Intelligent push conversation strategy, combined with evidence and similar cases, give suggestions such as key points for questioning, policy presentations, and timing of evidence presentation, and provide them to conflicting objects.

3. Practical Difficulties in the Use of Artificial Intelligence in Review and Investigation

3.1 Data Governance: Data Barriers, Unevenness and Security Risks

3.1.1 Data islands

The review and investigation data are scattered in multiple departments such as discipline inspection and supervision, public security, procuratorate, taxation, banking, customs, auditing, and market supervision. The data standards of each department are not uniform, the interfaces are not compatible, and the sharing mechanism is not perfect; The formation of "data islands" makes it difficult for artificial intelligence systems to integrate multi-source data for in-depth analysis, unable to give full play to the advantages of big data correlation analysis, and restricts the accuracy of clue mining, fund tracking, and case research and judgment[3]. For example, bank flow data cannot be effectively linked with industrial and commercial registration data, and real estate transaction data, making it difficult to fully track the entire chain of funds.

3.1.2 Uneven data

On the one hand, the review and investigation data contains a large amount of unstructured data (such as report letters, conversation recordings, surveillance videos, handwritten transcripts, etc.). The data format is chaotic, the content is scattered, and the labeling is not standardized, making it difficult to be directly identified and analyzed by artificial intelligence systems; On the other hand, some historical data have problems such as lack, error, redundancy, and distortion, such as vague reporting information, incomplete evidence records, and omission of financial data, resulting in low artificial intelligence model training data and biased and inaccurate output results.

3.1.3 Serious data security risks

The review and investigation data involve state secrets, work secrets, and personal privacy, and are highly confidential and sexual. In the process of artificial intelligence application, there are multiple security risks in data collection, transmission, storage, processing, sharing and other links: First, the risk of data leakage. In the process of multi-departmental data sharing, data leakage and abuse are prone to occur, threatening national security and personal privacy[4]; The second is the risk of data tampering. Malicious attackers may tamper with training data or case-handling data, causing artificial intelligence to output wrong results, resulting in case-handling errors and judicial injustice. Disciplinary inspection and supervision agencies mostly rely on external technology companies to provide technical

support. Other service providers may obtain and disclose confidential data in violation of regulations, posing a great security risk.

3.2 Algorithm Risk

3.2.1. Algorithmic bias leads to unfair results

The training of artificial intelligence models relies on historical case data. If the historical data itself has problems such as inconsistent law enforcement standards, regional differences, and human biases, these biases will be solidified or even amplified; For example, for public officials in specific industries, regions, and identities, the algorithm may have early warning or insufficient early warning problems, resulting in unfair clue screening and risk assessment, and affecting the fairness and credibility of review and investigation.

3.2.2. Algorithm black box triggers trust crisis

Current artificial intelligence algorithms (especially large language models and deep learning models) are highly complex and opaque, and the decision-making process is difficult to explain, forming an "algorithm black box". Case handlers cannot clearly understand the logic, basis and process of artificial intelligence output results, and it is difficult to judge the accuracy and reliability of the results; At the same time, in the process of case trial and judicial litigation, the results of algorithmic decision-making are difficult to be cross-examined and verified, causing doubts and a crisis of trust between the parties, and even affecting the legality and authority of the case.

3.2.3 Inadequate adaptability of the algorithm

The review and investigation work is professional, political, and highly normative, involving complex relevant regulations, case-handling procedures, and policy standards. At present, most of the artificial intelligence algorithm models are based on general scenarios, and do not fully combine the professional characteristics of the review and investigation work for in-depth optimization and customized training. As a result, the algorithm model has an inaccurate understanding of case-handling scenarios, violation characteristics, and legal connotations, and the output results do not fit well with actual case-handling needs. It is difficult to effectively solve complex cases and new problems, and the application efficiency is greatly reduced.

3.3 Human-Machine Coordination Imbalance

3.3.1 Technology dependence

The high efficiency and convenience of artificial intelligence can easily lead to the dependence of case handlers, and completely hand over core tasks such as clue screening, evidence review, case research and judgment, and document production to artificial intelligence, ignoring their own subjective initiative, accumulation, and independent judgment capabilities; In the past, the professional ability, thinking ability, and psychological game ability of case handlers gradually deteriorated, making it difficult to deal with complex and difficult cases and new types of crimes, and even "counting only" occurred, resulting in the risk of mishandling cases and wrong cases.

3.3.2 Boundary blurring.

The current application of artificial intelligence in review and investigation lacks a clear division of human-machine responsibilities, and does not clearly define which tasks are led by artificial intelligence, which are led by case handlers, and which require human-machine collaboration; "Duplicate labor" occurs in some links, case handlers overlap with artificial intelligence functions, and resources are wasted; There is a "responsibility vacuum" in some links, and artificial intelligence and case handlers shirk each other, resulting in low work efficiency and inadequate implementation of responsibilities.

3.3.3 Difficult division of responsibilities

After artificial intelligence intervenes in the review and investigation, a man-machine hybrid decision-making is formed. Once there are errors in handling cases or wrongful cases, the division of responsibilities is extremely complicated: is it caused by algorithm defects and data errors, or is it caused by lax review and misjudgment by case handlers? Is it the responsibility of the technical service provider, or the responsibility of the discipline inspection and supervision agency? Existing laws, regulations, and institutional norms do not clarify the boundaries of human-machine responsibility and standards for accountability, and the problem of "unfounded accountability and vacant responsibility" is prone to occur, which affects the credibility of cases and law enforcement [5].

3.4 Lagging System and Norms

3.4.1 Imperfect system of laws and regulations

At present, our country has no laws and regulations specifically targeting the application of artificial intelligence in the field of discipline

inspection, supervision, review and investigation. The existing laws and regulations such as the "Supervision Law", "Data Security Law", and "Personal Information Protection" only make principled regulations on data security and personal information protection., did not clarify the core issues such as the legal status, scope of application, authority boundary, procedural requirements, and division of responsibilities of artificial intelligence applications; As a result, artificial intelligence applications lack a clear legal basis, and some innovative applications are in a "gray area" and face compliance risks.

3.4.2 Lack of technical standards and operating specifications

The application of artificial intelligence in review and investigation lacks unified technical standards, data standards, interface standards, and operating specifications; The technical architecture, data format, and functional modules of artificial intelligence systems used by different regions and units are quite different, making it difficult to achieve system compatibility, data interoperability, and sharing; At the same time, the lack of operating procedures, standards, and safety specifications for artificial intelligence applications leads to irregular and uneven application processes, and security risks are difficult to control.

3.4.3 The regulatory mechanism is not perfect

The whole-process supervision mechanism for artificial intelligence applications has not yet been established, and there is a problem of "emphasizing construction and ignoring supervision": there is a lack of technical review, security assessment, and compliance review of artificial intelligence systems in advance; There is a lack of real-time monitoring and dynamic early warning of data flow, algorithm operation, and system operation; Afterwards, there is a lack of assessment, audit, and accountability for application effects, cases, and security risks; As a result, problems such as illegal operations, security risks, and algorithm bias in the application process of artificial intelligence are difficult to be discovered and corrected in a timely manner, affecting the standardization and security of applications.

3.5 Short Board of Talent Team

3.5.1. Low technical literacy of personnel

At present, most of the discipline inspection and supervision personnel have solid knowledge of relevant laws and regulations and rich case

handling, but generally lack professional knowledge and operational skills such as artificial intelligence, big data, and information technology; It is difficult to skillfully operate artificial intelligence systems, understand algorithm logic, interpret output results, troubleshoot technical failures, and even have "fear of technology", dare not use, do not know how to use, and do not make good use of artificial intelligence, which restricts the full use of technology application efficiency.

3.5.2 Shortage of compound talents

The deep integration of artificial intelligence and review and investigation work urgently needs compound talents who are proficient in discipline inspection and supervision business, artificial intelligence technology, legal literacy and data thinking; At present, the internal compound talent reserve of the discipline inspection and supervision system is seriously insufficient, and the external introduction is difficult and the number is small. It is difficult to apply artificial intelligence, system maintenance, algorithm optimization, risk prevention and control and other work needs, which has become the core bottleneck restricting the intelligent transformation of review and investigation.

3.5.3 Insufficient guarantee for technical personnel

Disciplinary inspection and supervision agencies mostly rely on external technology companies to provide technical support, and internal professional and technical personnel are scarce, making it difficult to independently carry out system operation and maintenance, algorithm optimization, data governance, security protection, etc.; The external technical team is not familiar with the review and investigation business, and it is difficult to accurately match the needs of case handling, resulting in iterative upgrades of the system, untimely response to problems, and inadequate technical services, which affect the stability and performance of artificial intelligence applications.

4. Countermeasures Empowered by Artificial Intelligence

4.1 Build an Integrated Data Governance System

4.1.1 Breaking down data silos

Break down data silos and establish a cross-departmental data sharing mechanism Led by the Commission for Discipline Inspection and the

National Supervisory Commission, in conjunction with public security, procuratorate, taxation, banking, customs and other departments, formulate a unified national review and investigation data standard, interface specification, and sharing process; Clarify the scope, authority, and confidentiality requirements of data sharing, and build a cross-departmental data sharing platform that is "led by discipline inspection and supervision, multi-departmental coordination, hierarchical authorization, and safe and controllable". Privacy computing, federated learning and other technologies are used to realize "data available but not visible". Under the premise of protecting data security and privacy, multi-departmental data joint modeling and association analysis are completed to solve the contradiction between data sharing and security protection.

4.1.2 Boosting Data

Improve data and consolidate the foundation of technology application Establish a data life cycle management mechanism, standardize data collection, entry, review, storage, update, destruction and other processes, clarify the main body of data responsibility, and control data from the source. Use artificial intelligence technology to carry out data cleaning, deduplication, completion, and labeling, automatically identify and correct erroneous data, delete redundant data, complete missing data, standardize and label unstructured data, and improve data standardization and standardization. Establish a data evaluation system, regularly evaluate the integrity, accuracy, consistency, and timeliness of data, dynamically optimize the data management process, and improve data.

4.1.3 Strengthen data security

Build a hierarchical and classified data security management system, implement differentiated security protection measures according to the level and degree of data confidentiality, and clarify the collection, transmission, storage, and use permissions of different levels of data. Adopt multiple security technologies such as physical isolation, encrypted transmission, access control, security audit, intrusion detection, and data backup to build an all-round and multi-level data security protection system to prevent data leakage, tampering, and loss risks [6]. Strengthen supervision over service providers, rigorously review their access qualifications, sign confidentiality agreements, clarify security responsibilities, conduct regular audits, establish

a blacklist system for service providers, severely crack down on violations, and eliminate potential safety hazards of suppliers.

4.2 Optimization Algorithm System

4.2.1 Eliminate algorithmic bias and ensure fair results

Construct a diversified, representative, and high-level training data set, incorporate case data from different regions, industries, identities, and types, balance data distribution, and avoid algorithmic bias caused by single and one-sided data. Establish an algorithm bias detection and correction mechanism, regularly conduct bias tests on the algorithm model, identify and correct discriminatory and tendentious deviations in the algorithm, and ensure that the algorithm treats all objects equally and the output results are fair and just. Introduce a diversified algorithm review mechanism, inviting discipline inspection and supervision experts, legal experts, technical experts, and public representatives to participate in the review of algorithm models. Evaluate from the perspective of algorithm fairness to prevent algorithmic bias.

4.2.2 Solve the black box problem

Prioritize algorithmic models with strong interpretability (such as decision trees, logistic regression, knowledge graphs, etc.) to replace highly complex and difficult-to-explain black box models, and improve algorithmic transparency from a technical level. Build an algorithmic decision-making visualization system, and intuitively present the algorithmic decision-making logic, data basis, reasoning process, key parameters, etc. in the form of charts and text, so that case handlers can clearly understand the ins and outs of the output results. Establish an algorithm explanation system. When the artificial intelligence system outputs the results, it must simultaneously provide a detailed explanation report, clarify the result basis, applicable scenarios, and risk warnings, and ensure that case handlers can understand, verify, and dare to accept.

4.2.3 Customized algorithm

Customize algorithms to improve business adaptability Set up a joint research and development team of "discipline inspection and supervision business experts and artificial intelligence technology experts" to conduct in-depth review and investigation on the front line, comprehensively sort out the case-handling

process, core needs, pain points and difficulties, and professional rules, and accurately grasp business characteristics. Based on the full-process scenario of examination and investigation, specialized algorithm models are customized for clue assessment, evidence review, case analysis, document preparation, interview assistance, risk warning, etc. These models deeply integrate laws and regulations, case-handling provisions, and policy standards to enhance the alignment between algorithms and business operations. Establish a closed-loop mechanism for algorithm iterative optimization, collect feedback from case-handling personnel, combine new features and changes in case-handling practices, optimize algorithm models, dynamically update algorithm rules, and ensure that algorithms adapt to changes in case-handling needs[7].

4.3 Balance Man-Machine Relationship

4.3.1 Clarify man-machine responsibilities

Clarify the boundaries of human-machine responsibilities to avoid the weakening of the subject. Establish the core principle of "case-handling personnel-led, artificial intelligence-assisted", and clarify the division of human-machine responsibilities: case-handling personnel lead core links such as case decision-making, qualitative measurement and discipline, conversation breakthroughs, evidence acceptance, and responsibility determination, and assume the final decision-making responsibility; Artificial intelligence focuses on transactional, repetitive, and technical work such as data processing, clue screening, information extraction, document generation, risk early warning, and auxiliary analysis, and provides reference opinions. Formulate a list of human-machine collaborative operations, refine the human-machine division of labor in each link, clarify the auxiliary positioning of artificial intelligence, strictly prohibit artificial intelligence replacement personnel from making core decisions, and strengthen the dominant position and sense of responsibility of case-handling personnel[8].

4.3.2 Preventing Technology Dependence

Strengthen the capacity building of case handlers to prevent technology dependence. Carry out normalized artificial intelligence technology training, incorporate artificial intelligence, big data, and information technology into the core content of the education and training of

discipline inspection and supervision cadres, and improve the technical literacy, system operation ability, and algorithm interpretation of case handlers through special lectures, practical drills, and case teaching. ability[9]. To establish a correct concept of technology application and guide case handlers to rationally understand the auxiliary role of artificial intelligence, we must not only actively use technology to improve efficiency, but also adhere to independent thinking, judgment, and subjective initiative, avoid relying on technology, and prevent "calculation only". Establish an incentive mechanism for the assessment of case-handling capabilities, incorporate professional capabilities, independent case-handling levels, and complex case breakthrough capabilities into the assessment, and force case-handling personnel to improve their core business capabilities and meet the needs of intelligent case-handling.

4.3.3 Clarify accountability standards

Improve the human-machine responsibility division mechanism and clarify the accountability standards. Improve laws, regulations and institutional norms, and clarify the responsibility division standards under human-machine mixed decision-making: technical service providers and system operation and maintenance units shall bear corresponding responsibilities for case-handling errors caused by algorithm defects, data errors, and system failures; The case-handling personnel shall bear the main responsibility for case-handling errors caused by lax review, misjudgment, and illegal operations by the case-handling personnel. Establish a whole-process trace system for algorithm logs. During the operation of the artificial intelligence system, information such as input data, model versions, output results, decision paths, operation records, and modification traces are automatically recorded. Provide basis. Build a degree accountability mechanism, and investigate the discipline responsibilities, government affairs responsibilities, and legal responsibilities of relevant units and personnel in accordance with laws and regulations according to the nature of responsibilities and the degree of influence, so as to ensure that responsibilities are in place and accountability is based on evidence[10].

4.4 Improve the System

4.4.1 Clarify the legal basis

Improve the system of laws and regulations and

clarify the legal basis Promote special legislation, the "Regulations on the Administration of Artificial Intelligence Application in Disciplinary Inspection and Supervision", clarifies the core issues such as the legal status, scope of application, authority boundaries, procedural requirements, data rules, division of responsibilities, and safety standards of artificial intelligence in the field of review and investigation, and provides technical applications. Clarify the legal basis. Revise and improve existing laws and regulations, include artificial intelligence applications in the scope of laws and regulations such as the "Supervision Law", "Data Security Law", and "Personal Information Protection", refine relevant provisions, eliminate legal gaps, and ensure that artificial intelligence applications are legal and compliant throughout the process.

4.4.2 Unified technical standard

The Standardization Management Committee of the Commission for Discipline Inspection and the National Supervisory Commission shall formulate a unified national review and investigation of artificial intelligence application technical standards, data standards, interface standards, security standards, and standards, and standardize system research and development, data governance, algorithm applications, and system operation and maintenance. Compile the "Artificial Intelligence Assisted Review and Investigation Operation Specifications" to clarify the operation process, use authority, requirements, safety specifications, and emergency response measures of artificial intelligence applications, unify operating standards, standardize application behaviors, and ensure the standardization and standardization of artificial intelligence applications throughout the process.

4.4.3 Build a full-process supervision mechanism

Build a full-process supervision mechanism to standardize application behavior Establish a closed-loop supervision system of "pre-review-in-process monitoring-post-event evaluation": Pre-review: Set up a joint review team of "discipline inspection and supervision business experts, legal experts and technical experts" to conduct a comprehensive review of the technology maturity, data security, algorithm fairness, business adaptability, and compliance of the artificial intelligence system to be introduced. It cannot be put into use after

passing the review. In-process monitoring: Build a real-time monitoring platform for artificial intelligence applications to conduct real-time monitoring and dynamic early warning of data flow, algorithm operation, system operation, and output results, and timely discover and correct problems such as illegal operations, security risks, and algorithm abnormalities [11]. Post-event evaluation: Establish a regular evaluation mechanism for application effects, regularly evaluate the effectiveness of artificial intelligence applications from the dimensions of case handling efficiency, cases, accuracy, safety, compliance, and satisfaction, summarize and find deficiencies, and dynamically optimize application plans and regulatory measures.

4.5 Strengthen the Construction of Compound Talents

4.5.1 Strengthen the training of compound talents

Increase the cultivation of compound talents Relying on discipline inspection and supervision cadre colleges, universities, and scientific research institutes, set up discipline inspection and supervision artificial intelligence and big data compound professional courses to cultivate professionals who are proficient in discipline inspection and supervision business, artificial intelligence technology, legal literacy and data thinking. Implement the two-way temporary exchange mechanism of "business backbone and technical backbone", select discipline inspection and supervision business backbones to study artificial intelligence technology in technology companies and scientific research institutes, select technical experts to discipline inspection and supervision agencies for temporary training, familiarize themselves with case-handling business, and promote the deep integration of business and technology. Carry out activities such as mentor-apprentice pairing, actual combat training, and case studies, use the old to lead the new, and use the strong to lead the weak, cultivate compound talents in actual combat, and improve the overall quality of the talent team[12].

4.5.2 Smooth channels for talent introduction

Unblock the introduction channels of compound talents Formulate preferential talent introduction policies for universities, scientific research institutes, and technology companies, focusing on introducing high-end talents and professional and technical talents in the fields of artificial

intelligence, big data, computer science, and data security, and enriching the discipline inspection and supervision talent team. Use flexible introduction, specially appointed experts, project cooperation, etc., invite external technical experts and business experts to participate in artificial intelligence system research and development, algorithm optimization, risk prevention and control, talent training, etc., and leverage external intellectual resources to make up for the shortcomings of internal talents.

4.5.3. Strengthen the guarantee of technical personnel

Set up internal technical positions and technical departments of the discipline inspection and supervision system, equipped with full-time artificial intelligence, big data, and information technology operation and maintenance personnel, responsible for daily system operation and maintenance, algorithm optimization, data governance, security protection, technical training, etc., to ensure the stability of the artificial intelligence system Operation, iterative upgrade. Establish an incentive mechanism for technical talents, give preference in terms of salary, professional title evaluation, promotion, etc., attract and retain technical talents, stimulate the enthusiasm, initiative, and creativity of technical talents, and provide technical support for the intelligent transformation of review and investigation.

5. Conclusion and Outlook

With its powerful data processing, correlation analysis and abnormal identification capabilities, artificial intelligence can comprehensively empower the core work of review and investigation, effectively break through the limitations of case handling, and deal with new problems. It is an important driving force for improving the quality and efficiency of discipline inspection and supervision work. At present, its application still faces problems such as weak data governance, risky algorithms, unbalanced human-machine collaboration, lagging system norms, and lack of professional talents. Multiple factors interweave to restrict the effectiveness of technology empowerment and affect the standardization and security of case handling. In this regard, it is necessary to coordinate and optimize data, algorithms, human-machine collaboration, system construction, and talent training to promote the safe, standardized, and deep integration of

artificial intelligence and review and investigation work.

With technological breakthroughs such as large language models and multi-modal intelligence, artificial intelligence will realize the intelligent empowerment of the entire process of review and investigation, complete the upgrade from perception and cognitive intelligence to decision-making intelligence, and the human-machine collaboration and supporting supervision system will also be improved. In the future, it is necessary to base ourselves on the practice of handling cases, optimize applications and institutional mechanisms, strengthen talent support, and promote the upgrading of intelligent case handling technology from "usable" to "easy to use, effective, and safe to use", so as to provide a solid scientific and technological guarantee for the in-depth advancement of anti-work in the new era.

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