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Regulation of Automated Administration via Technical Due Process in the Context of Algorithmic Black Box

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Abstract: Automated administration relies on algorithmic technologies to achieve innovative breakthroughs in the efficiency of public governance; however, the endogenous complexity of algorithms and the proprietary, closed nature of source code have collectively engendered the "algorithmic black box". This phenomenon substantially deprives administrative counterparts of their right to statement and defense, thereby precipitating a systemic failure of traditional due process principles in fully autonomous automated administration scenarios. The algorithmic black box dismantles the operational foundations of traditional due process across three critical dimensions: bidirectional information transmission, procedural adversarial mechanisms, and recusal systems intended to preclude bias. Consequently, existing procedural regulations are fundamentally ill-equipped to adapt to the technical architecture of automated administration. A regulatory pathway centered on technological due process constructs an institutional closed loop of "preventive safeguards, adversarial empowerment, and corrective control" through the synergistic application of algorithmic disclosure, algorithmic explanation, algorithmic auditing, and algorithmic review. By employing technology to constrain technology, this approach helps mitigate the opaqueness of the algorithmic black box. Ultimately, this pathway supplements and adapts the core of administrative procedural justice to the digital age, balances the efficiency of technological governance with the imperative to safeguard the rights of administrative counterparts, and propels the standardized operation of automated administration along the trajectory of the rule of law, thereby realizing a profound integration of algorithmic justice and procedural justice.

Keywords: Algorithmic Black Box; Automated Administration; Technological Due Process; Algorithmic Transparency

1 Introduction

Digital technologies have profoundly empowered public governance. Algorithm-centric automated administration has become the dominant paradigm in modern administrative operations. Leveraging the advantages of highly efficient decision-making and precise processing, it has fundamentally revolutionized the efficiency and paradigms

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of administrative governance. However, the endogenous complexity of algorithmic technologies, coupled with the confidentiality nature of source code derived from trade secrets and national security imperatives, has collectively engendered the "algorithmic black box"—a core dilemma in digital administration. The algorithmic black box not only substantially deprives administrative counterparts of their right to statement and defense, but also precipitates the systemic failure of traditional due process principles, which are fundamentally predicated on bidirectional information communication and adversarial debate. Consequently, the procedural justice of administration in the digital age confronts formidable challenges. How to pierce the algorithmic black box and reconstruct a procedural regulatory framework adaptable to automated administration has emerged as a critical imperative for administrative law in responding to the transformation of digital governance. Proceeding from the formative logic of the algorithmic black box and its pathways of rights erosion, this paper dissects the adaptational deficiencies of traditional due process. It subsequently explores the regulatory trajectories of technological due process, aiming to provide theoretical and institutional support for the legalized and standardized development of automated administration.

2 The Algorithmic Black Box and Its Impairment of Rights

2.1 Formation of the Algorithmic Black Box

In the context of automated administration, the use of personal information for decision-making relies on the data-driven predictions and autonomous selections of machine learning algorithms. The evolution of algorithmic technology has progressed from symbolic learning, which relied on domain experts to manually encode "if-then" rules, to statistical learning characterized by automated feature extraction, and finally to contemporary deep learning models that leverage breakthroughs in computational power to achieve complex reasoning and natural language understanding (Yeung, 2018). This inherent technological progression and increasing sophistication have erected a formidable cognitive barrier that the general public has difficulty surmounting.

Beyond these endogenous technical factors, the proprietary nature of algorithmic code further exacerbates the "black box" effect. On one hand, automated administrative algorithms are frequently outsourced to private enterprises, which often refuse to disclose source code by invoking trade secret protections (Brauneis & Goodman, 2018). On the other hand, even when developed in-house by administrative agencies, disclosure is frequently exempted on the grounds of preventing tampering, avoiding legal circumvention, or safeguarding national security (Wang et al., 2019). Consequently, the combination of inadequate procedural transparency and inherent incomprehension prevents administrative counterparts from grasping the technical standards and operational logic of automated decision-making, culminating in the structural phenomenon of the "algorithmic black box".

2.2 Impact of the Algorithmic Black Box on Administrative Counterparts' Rights

The opacity of the algorithmic black box severely erodes the right to participation for administrative counterparts, effectively depriving them of their right to statement and defense. Specifically, the algorithmic black box directly undermines the procedural basis for exercising these rights. By relying on the continuity and instantaneous nature of algorithmic decision-making, automated administration achieves an instantaneous closed loop from data perception to

execution. This high-efficiency decision-making model drastically compresses the space for participation, causing the statement and defense phase—which should precede the administrative decision—to be overlooked or postponed within the technical workflow, leading to a substantial collapse of ex-ante remedy functions.

First, the algorithmic black box severely impedes administrative agencies from fulfilling their statutory procedural obligation to provide reasons. When counterparts face adverse decisions, agencies often find it difficult to articulate the causal derivation between raw data (such as personal credit records or online behavioral data) and the final discretionary outcome. For instance, in tax credit ratings, if an agency utilizes web-crawled information as evaluative factors but fails to explain the comprehensiveness of the data extracted or the weights assigned to them as discretionary factors, the counterpart is unable to effectively contest the factual basis of the decision (Zhang, 2022). Second, the algorithmic black box poses a challenge to traditional standards of proof and rules of evidence. The closed nature of algorithmic operations and the concealment of derivative data disrupt established evidentiary forms (Zhu, 2023); the refusal of agencies to disclose processing rules for raw data results in a broken chain of evidence, leaving counterparts unable to rebut unfavorable evidence during remedy procedures and essentially depriving them of the tools to challenge automated decisions. Finally, automated decision-making is highly preset, as the parameters and computational logic embedded by technicians into the code during the coding phase are characterized by standardization, often failing to account for the unique circumstances of individual cases. When counterparts raise defenses based on individual circumstances, they are confronted with algorithmic logic already solidified in code, significantly diminishing the functional safeguards of the procedure.

3 Systemic Failure of Traditional Due Process Principles

In traditional administrative acts, the principle of due process centers on the avoidance of bias, administrative participation, and administrative openness, safeguarding fundamental rights such as the administrative counterpart's right to know and the right to a hearing. The reason the principle of due process can function as a safeguard for rights lies in its construction of information communication and adversarial mechanisms between the administrative subject and the counterpart (Zhang, 2020). The effective operation of these two mechanisms relies heavily on the transparency and intervenability of traditional administrative acts—namely, that the counterpart can perceive the occurrence of the procedure and that the administrative agency can pause to hear the party's opinions before a decision is rendered. However, as the governance paradigm shifts toward automated decision-making, the pervasive "algorithmic black box" has completely subverted this underlying logic, leading to a systemic failure of the traditional due process principle in addressing automated administration.

3.1 Breakdown of Information Communication Mechanisms

At the data input stage, the algorithmic black box manifests as a concealed and imperceptible collection process, which fundamentally obstructs the bidirectional information transmission mechanism upon which due process relies. Administrative participation within the principle of due process requires the administrative subject to direct the flow of information toward the counterpart through systems such as prior notification and the provision of reasons; the counterpart then provides feedback via statements and defenses, forming a "transmission-reception" bidirectional channel. However, under the operational logic of the algorithmic black box, technical tools such as web crawlers and biometric sensors

break through the constraints of physical space and behavioral scenarios, forming a "round-the-clock, full-scope data collection" data extraction capability. Once collected, data is immediately cleaned, labeled, and analyzed within the black box. This "black-box operation", which lacks both visualized boundaries in physical space and clear operational traces in digital space, renders administrative agencies unable to send substantive information to counterparts in a timely manner. Traditional notification procedures are thus alienated into boilerplate terms on login pages or obscured privacy policies. Under the shroud of the algorithmic black box, the information communication mechanism becomes a closed one-way street, and the counterpart's right to know is substantively stripped away.

3.2 Collapse of Procedural Adversarial Mechanisms

The continuity and closure of internal processing within the algorithmic black box have completely dismantled the adversarial mechanism of due process. Due process requires that an administrative agency must hear the counterpart's statement and defense before making a decision; this pausing mechanism is essentially the creation of an adversarial space for information exchange through procedural interruption. However, under the canopy of the algorithmic black box, the shift from data collection and analysis to decision-making is often instantaneous, leaving no room for procedural pause for adversarial information exchange. More profoundly, the closed nature of the algorithmic black box ensures that the deductive logic of automated decisions remains unknown. Because the black box severs the transparency between input and output, administrative agencies themselves are often unable to clearly articulate the causal link between raw data and the final decision. Faced with a decision whose factual basis and deductive logic are hidden by the black box, it is difficult for administrative counterparts to provide targeted defenses. Consequently, the adversarial mechanism established by due process is entirely deconstructed by the algorithmic black box, losing the foundation upon which it functions.

3.3 Undermining of Bias Recusal System

The opacity of the algorithmic black box causes a misalignment in the system for avoiding bias within the due process principle, making it difficult to achieve the value objectives of maintaining personal dignity and minimal justice. Avoiding bias in traditional administrative acts primarily regulates the subjective preferences or conflicts of interest of administrative staff as natural persons through the prohibition of prejudice and recusal systems. Although automated systems lack human emotions, the algorithmic black box itself harbors more insidious systemic biases. This discrimination may stem from "training data bias" during the data collection phase, or it may be reproduced as implicit bias during model selection and feature training (Jiang & Wang, 2024). The generation mechanism of algorithmic bias is buried deep within the technical black box, which is fundamentally different in logic from the generation of bias in administrative staff. Traditional recusal systems cannot penetrate the code level to scrutinize and eliminate these hidden algorithmic biases, leaving them powerless to regulate the risks of injustice derived from the black box.

In summary, a fundamental conflict exists between the informational toolkit of the due process principle and the technical architecture of automated administration dominated by the algorithmic black box. The principle of due process attempts to construct staged information communication and adversarial debate mechanisms through clear nodes in traditional administrative acts. However, by means of imperceptible information collection and the continuity and closed logic of the decision-making process, the algorithmic black box eliminates the spatio-temporal conditions necessary for exercising original procedural rights. To resolve the rule-of-law dilemma brought about by the algorithmic

black box, technology must be used to constrain technology, embedding verifiable, traceable, and adversarial technical rights-guarantee mechanisms into existing principles to achieve a deep integration of algorithmic justice and procedural justice.

4 Technological Due Process: Addressing the Algorithmic Black Box Dilemma

To resolve the dilemma posed by the systemic failure of traditional principles, it is imperative to employ technology to constrain technology, embedding verifiable, traceable, and adversarial technical safeguard mechanisms for rights within the existing framework of due process. Technological due process advocates the establishment of explicit rules as built-in norms within automated decision-making systems to enhance transparency and accountability (Citron, 2008). Within this framework, transparency requirements, algorithmic explanation obligations, and review mechanisms must be integrated into the technical architecture, thereby forming a tripartite institutional closed loop of "preventive safeguards, adversarial empowerment, and corrective control".

4.1 Algorithmic Disclosure

The core genesis of the algorithmic black box lies in the divergence between technical rules and textual legal rules in automated administration. Under the traditional administrative paradigm, the decision-making bases, discretionary standards, and boundaries of authority of administrative agencies are all embodied in publicly available legal texts, rendering the connotation, scope of application, and legal effects of the rules inherently predictable. By contrast, in automated administration, the entire process from fact-finding and element matching to final decision output must be translated into executable code logic by computer programmers to achieve operationalization. Rules prior to codification are defined as "textual rules", whereas the algorithms subsequent to codification constitute "technical rules". In the context of automated administration, textual rules and technical rules exist in a relationship of form and substance; the actual impact on the rights and obligations of administrative counterparts is fundamentally determined by the technical rules (Yu, 2024). During the technical translation of textual rules, administrative agencies may, on the one hand, interpret these rules expansively to enlarge their own jurisdiction; on the other hand, programmers may inadvertently or deliberately embed their personal biases during the coding process. Consequently, the principle of technological due process dictates that the technical rules of automated systems must not be derived from policy statements or interpretive norms that have circumvented formal administrative rulemaking procedures.

Algorithmic disclosure serves as the most direct mechanism for enhancing the visibility of automated decision-making. Proceeding from the fundamental principles of due process, administrative agencies must disclose their decision-making bases when rendering decisions that affect the rights and obligations of administrative counterparts. Whereas in automated administration, the algorithm itself constitutes the very core of the decision-making basis. For instance, Canada's Directive on Automated Decision-Making requires public disclosure of system purpose, logic, and impact assessment rather than full source code (Treasury Board of Canada Secretariat, 2025); however, the primary impediments to algorithmic disclosure are the protections afforded to source code under the auspices of trade secrets and national security. Regarding source code protected as trade secrets, Robert and Ellen propose a "balancing of trade secrets and the disclosure of government information". This approach suggests that when administrative agencies enter into development agreements for automated administrative systems with private entities, they should integrate

government information disclosure requirements with trade secret protection clauses. Private entities must specify these clauses by explicitly delineating protected from unprotected source code, thereby enabling administrative agencies to disclose non-core, non-secret technical rules rather than executable code (Brauneis & Goodman, 2018).

Although algorithmic disclosure holds foundational value in the technical due process regulatory system, it still exhibits inherent limitations in the practical operation of automated administration and cannot independently assume the full function of piercing the algorithmic black box. First, for automated administrative systems involving national security or public security, administrative agencies often refuse to disclose the full algorithmic source code on the grounds of "national security" or "public interest." Second, algorithmic code possesses a highly professional and technical nature. Even if administrative agencies disclose all source code, the vast majority of administrative counterparts without specialized computer expertise cannot comprehend its operational logic, let alone identify the rule alienation and decision-making biases embedded within it. This "formal disclosure" fails to translate into "substantive right to know," nor can it facilitate effective public oversight.

4.2 Algorithmic Explanation

4.2.1 Core Advantages of Algorithmic Explanation

Algorithmic disclosure, centered on the disclosure of technical details, constitutes systemic transparency targeted at professional entities. It only satisfies the compliance review requirements of regulatory authorities and cannot address the case-specific inquiries of ordinary administrative counterparts. When confronted with the outcomes of automated administration, the procedural demands of administrative counterparts do not center on mastering complex algorithmic principles, model architectures, or source code, but rather focus on the rationality of the decision at the individual case level—specifically, "why was this administrative decision made against me?" This represents an extension of the core tenet of the "duty to give reasons" under due process into the realm of automated administration. Algorithmic explanation, as a legal-procedural obligation, is tailored to the counterpart's understanding; it focuses on the correlative elements of the administrative decision to directly resolve the counterpart's core perplexities regarding their own rights and interests. Consequently, algorithmic explanation essentially constitutes an individual-oriented case-based reasoning mechanism rather than a technology-oriented systemic disclosure. This aligns highly with the fundamental procedural expectations of administrative counterparts, and also represents the defining feature that distinguishes technical due process from traditional procedural systems (Ding, 2022).

Another core advantage of algorithmic explanation is its capacity to achieve a balance among pluralistic legal interests. Algorithmic disclosure represents the most radical paradigm of algorithmic transparency; mandating the public release of the source code and core parameters of automated administration would directly infringe upon the technical secrets of administrative agencies and the trade secrets of third-party algorithmic service providers. It could even result in the leakage of core data involved in personal information processing, thereby imperiling data security and administrative technological autonomy. By contrast, algorithmic explanation obviates the need to disclose core technical details. It merely requires articulating to the counterpart the considerations, decision-making logic, weight impacts, and other elements directly related to their rights and interests concerning the administrative decision. This approach not only fulfills the transparency requirements of technological due process but also circumvents the risk of technological leaks, thereby achieving a proportional balance between the counterpart's right to know and the imperative of

technological confidentiality—an institutional outcome that algorithmic disclosure is inherently incapable of attaining (Lin, 2019).

4.2.2 Specific Approaches to Algorithmic Explanation

From the dual perspectives of technology and law, algorithmic explanation can be divided into two pathways: global explanation and local explanation. These correspond to the ex ante disclosure and ex post reasoning stages of technological due process, respectively, and jointly respond to the procedural demands of administrative counterparts.

Global explanation entails a generalized and universal explication of the systemic functions, generic rules, and core considerations of algorithms in automated administration, constituting an ex ante explanatory obligation. Its core lies in informing unspecified counterparts of the general logic behind the administrative action rather than case-specific details. Its specific content includes: the scope and conditions of application of automated administrative systems, basic standards for fact-finding, core discretionary factors and their weight ranges, types of decision outcomes and their legal effects, basic rules and public notice procedures for algorithmic iteration, etc. Under the framework of technological due process, global explanation constitutes an ex ante procedural obligation; administrative agencies should disclose the aforementioned content via government platforms, administrative guides, and other channels prior to the initiation of automated administration. For instance, in the automated review of administrative benefits, the information dimensions considered by the review algorithm—such as personal income, social security contributions, and family circumstances—must be disclosed in advance. The value of global explanation lies in enabling counterparts to apprehend the basic rules of personal information processing in advance, thereby laying the groundwork for subsequent procedural participation and the raising of objections. It represents the materialization of the "prior notice" requirement within technological due process.

Local explanation, conversely, refers to personalized and specific elucidations directed at particular administrative counterparts regarding administrative decisions that implicate them individually. Local explanation directly responds to the counterpart's core demand of "why this administrative decision was made against me". Its content focuses on the case level, encompassing: the case facts ascertained by administrative agencies, the legal bases on which the decision is rendered, the discretionary factors actually applied in this case and their specific weights, the logical deduction relationship between the facts and the legal bases, the acceptance status of the facts and reasons submitted by administrative counterparts, etc. Local explanation constitutes the core of the ex post reasoning system in technological due process. In contrast to the universality of global explanation, local explanation possesses three distinctive features. First, targetedness: it only discloses content directly related to the decision in the specific case and does not involve the general technical rules of the system. Second, intelligibility: it must employ language comprehensible to the general public and refrain from using technical jargon. Third, refutability: the explanatory content must be clear and specific, and provide clear guidance for administrative counterparts to exercise their right to statement and defense (Xu & Zhu, 2020). For example, in automated administrative penalty discretion, Administrative agencies shall explain to administrative counterparts the specific ascertainment of their illegal facts, the discretionary points added or deducted corresponding to each illegal circumstance, and the calculation process of the final penalty outcome. From a technical standpoint, Local explanation explains to administrative counterparts "how the decision outcome would change if a specific factual element were to change", thereby enabling them to clearly understand the causal connection between their own conduct and the administrative decision outcome, thereby aligning with the case-specific reasoning

requirements of due process.

Contextual variations in automated administration dictate the boundaries of applicability for global and local explanations. In scenarios such as general government notifications and the automated collection of non-sensitive personal information, administrative entities are only required to fulfill the obligation of global explanation, dispensing with the need for case-specific local explanation, thereby balancing administrative efficiency with procedural due process. For decisions that significantly impact the rights and interests of counterparts—such as automated discretion in administrative penalties, administrative licensing reviews, and the provisioning of administrative benefits—both global and local explanatory obligations must be discharged concurrently. Global explanation safeguards the ex ante right to know, while local explanation operationalizes the ex post right to reasoning, thereby fully realizing the mandates of technological due process. In scenarios where administrative counterparts raise objections, administrative entities must provide further local explanations tailored to the substance of the objections to secure the counterparts' rights to procedural relief (Su, 2022).

4.3 Algorithmic Auditing

The most prominent procedural dilemma caused by the algorithmic black box is the invisibility and untraceability of the automated decision-making process. This directly reduces the duty to give reasons under traditional administrative law to a mere formality and further fundamentally undermines the basis for the exercise of administrative counterparts' right to statement and defense. In response to this problem, the theory of technical due process takes the full-process audit trail system as the core technical support for addressing the algorithmic black box. It advocates transforming the invisible algorithmic operational process into recordable, verifiable and traceable digital traces through technical means, so as to provide objective and neutral technical evidence for the realization of procedural justice. Technological due process requires an algorithm auditing system supported by audit trails to record the full decision-making process, to record the facts and rules upon which all decisions in a given case are based, thereby generating a comprehensive decision history. Should human intervention occur during the automated decision-making process, the identities of the relevant personnel, alongside their specific operations or opinions, must also be documented. By leveraging audit trails, administrative agencies can furnish administrative counterparts with the rationale behind rulings made by automated decision-making systems regarding their fundamental rights, thereby ensuring the effective realization of their subsequent right to statement and defense. Furthermore, audit trails encourage hearing officers to critically evaluate the conclusions generated by automated decision-making systems, discarding the presumption of absolute infallibility often attributed to automated decisions. Technological due process further necessitates the promulgation of unified legal norms governing audit trails to reduce the implementation costs of such systems and to ensure consistency in the format and content of notices provided to diverse administrative counterparts.

The establishment of an auditing system ensures the traceability of personal information processing within automated decision-making, enabling the tracking of historical records pertaining to both the automated decision-making process and data processing (Liu, 2020). Utilizing audit trails, administrative agencies can demonstrate to counterparts across various procedural nodes whether their personal information has been processed lawfully and reasonably. This includes, for instance, verifying whether notification obligations were fulfilled at the data collection node, whether the acquired data is accurate and comprehensive, and whether any errors occurred or model biases were introduced during the data processing phase. When administrative counterparts raise objections to an administrative decision, the agency

can extract snapshots of the decision tree at specific temporal nodes, thereby achieving a dual self-authentication of both procedural and technological compliance.

4.4 Algorithmic Review

The most profound governance crisis posed by the algorithmic black box is the lack of accountability of automated administrative power. Under the traditional administrative paradigm, the subject of responsibility for administrative decisions is clear, the decision-making process is traceable, and decision-making errors can be corrected through channels such as administrative reconsideration and administrative litigation. Whereas in automated administration, decision-making authority shifts from administrative personnel to algorithmic systems. The translation process from textual rules to technical rules harbors multiple risks, and the autonomous evolution of machine learning algorithms is even more likely to generate unforeseeable systemic biases. In the event of a decision-making error or infringement of rights, a dilemma of shifting responsibility often arises, characterized by the refrain: "Whoever develops is responsible, whoever uses is responsible, whoever supervises is responsible."

4.4.1 Tripartite Algorithmic Review System

The algorithmic review system ensures the accountability of automated administrative systems. During the translation of textual rules into technical rules, programmers may not only commit technical errors but also expansively interpret the scope of textual rules, incorporate policy-oriented or interpretative clauses, or even inject personal biases into the coding process. Furthermore, during the machine learning process, the automated administrative system itself may spontaneously generate algorithmic discrimination. Consequently, administrative agencies ought to conduct regular tripartite reviews of automated administrative systems, encompassing value, legal, and technical dimensions. Regarding value review, administrative agencies must leverage big data to detect whether the automated system has generated algorithmic discrimination or moral hazards, such as high-risk alerts based on characteristics like race, skin color, or geographic region. Concerning legal review, the crux lies in scrutinizing the bidirectional mapping system between "norms and code". The translation of traditional legal rules into algorithmic rules is by no means a simplistic process of logical coding, but rather a process of normative concretization embedded with value judgments. Reviewing bodies must visualize the decision-making rules within machine learning models and dynamically benchmark them against original normative documents to detect whether the algorithm has autonomously fabricated penalty scenarios not prescribed by law via feature engineering. As for technical review, the operational principles of the algorithm, the scope of data collection, the accuracy of data processing, and the training methodologies of the models all constitute focal points of scrutiny. For instance, during the data collection phase, statistical testing of the training data's representativeness is imperative to ensure it encompasses diverse application scenarios and demographic characteristics.

4.4.2 Full-Process Closed-Loop Review Mechanism

Algorithmic review is not a one-off compliance check, but a dynamic process that runs through the full lifecycle of automated administrative systems. Technical due process requires the establishment of a closed-loop review mechanism of "pre-event prevention, in-process monitoring, and post-event correction" to achieve early detection, early warning, and early disposal of risks.

Pre-event preventive control is the first line of defense for algorithmic review. For newly developed or significantly updated automated administrative systems, a comprehensive tripartite review must be completed prior to their official

deployment. The "regulatory sandbox" system for smart cities pioneered in Shenzhen provides important reference value: newly deployed automated administrative systems shall operate in a closed simulation environment and undergo full-scenario testing using historical or simulated data to fully expose potential technical defects, rule loopholes, and value biases (Shenzhen Administration for Market Regulation, 2025). They may only be officially launched after rectification, improvement and passing the final review. Meanwhile, administrative agencies shall publish an algorithmic impact assessment report before the system goes online, disclose the system's functions, objectives, potential risks, and review status to the public, and accept public oversight.

In-process dynamic monitoring is the core link of algorithmic review. During the operation of automated administrative systems, decision-making quality may deteriorate due to factors such as changes in data distribution, model drift, and external attacks. Administrative agencies shall establish a dynamic monitoring platform for algorithmic operation to conduct real-time monitoring of key parameters such as decision accuracy rate, error rate, complaint rate, and discrimination indicators, and set risk warning thresholds. Once abnormal situations are detected, emergency review procedures shall be activated immediately, the operation of relevant systems shall be suspended, the causes of problems shall be identified, and timely rectifications shall be implemented.

Post-event corrective feedback is the ultimate safeguard for algorithmic review. Administrative agencies shall conduct comprehensive annual reviews of automated administrative systems on a regular basis and publish review results and analytical reports to the public, detailing the system's operation status, identified problems, rectification measures, and future plans. The UK Algorithmic Transparency Recording Standard explicitly requires public sectors to regularly disclose the decision-making logic, data sources, bias mitigation measures, and review results of algorithmic systems(UK Government, 2021). This practice provides a reference for China to establish a transparent algorithmic review mechanism. For illegal or irregular issues identified in the reviews, relevant entities and personnel shall be held legally accountable in accordance with the law; for improper administrative decisions caused by algorithmic errors, they shall be revoked or modified in a timely manner, and remedies shall be provided to affected administrative counterparts.

4.4.3 Independent Third-Party Review

Self-review by administrative agencies has inherent limitations and is prone to the problem of "judge in one's own cause", making it difficult to guarantee the objectivity and impartiality of the review. To address the deficiencies of self-review, technical due process requires the establishment of an independent information technology review committee, which acts as a third-party oversight body to conduct an independent review and supervision of automated administrative systems.

The membership composition of the independent information technology review committee shall have broad representativeness and professionalism. In addition to representatives of administrative agencies, it shall include experts and scholars in the fields of computer science, jurisprudence, ethics, sociology, and statistics, as well as NPC deputies, CPPCC members, representatives of industry associations, and representatives of the general public. The committee shall operate independently and be free from unlawful interference by administrative agencies. Its review opinions shall have legal binding force, and administrative agencies must respond to and implement the rectification recommendations put forward by the committee.

The independent review committee shall establish a full-process oversight mechanism of "algorithmic impact assessment, dynamic monitoring, and inquiry hearings": conduct independent algorithmic impact assessments for the

launch of major automated administrative systems; carry out regular independent monitoring of system operation; hold regular algorithmic inquiry hearings to solicit opinions from administrative agencies, experts, scholars, and the public, and conduct special reviews of controversial algorithmic systems. Through independent third-party review, the dilemma of administrative self-supervision can be effectively resolved, and the credibility and authority of algorithmic review can be enhanced.

5 Conclusion

Automated administration, leveraging algorithmic technology, has significantly enhanced the efficiency of public governance, emerging as a crucial paradigm of administrative operations in the digital era. However, the underlying algorithmic black box concomitantly presents novel challenges to administrative procedural justice and the safeguarding of the rights of administrative counterparts. Traditional principles of due process struggle to function effectively within the architectural framework of algorithmic technology, necessitating the urgent adoption of technological due process as a pivotal mechanism to construct a procedural regulatory system adaptable to automated administration. Through the synergistic application of algorithmic disclosure, algorithmic explanation, algorithmic auditing, and algorithmic review, it is possible to pierce the algorithmic black box and rectify procedural deficiencies. This approach not only standardizes the operation of automated decision-making but also adequately safeguards the core rights of administrative counterparts, including the right to know and the right to statement and defense. Ultimately, only by continually refining the procedural rules of automated administration within the equilibrium between technological innovation and the rule of law can algorithmic governance consistently adhere to the baseline of fairness and justice, thereby propelling the healthy development of digital administration along the trajectory of the rule of law.

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