

# Systematic Reflection and Optimization of Digital Empowerment in Procuratorial Supervision

Lingjie Jiang<sup>1</sup>

<sup>1</sup> School of Agricultural Economics and Rural Development, Renmin University of China, Beijing, P.R. China

Correspondence: Lingjie Jiang, School of Agricultural Economics and Rural Development, Renmin University of China, Beijing, P.R. China.

doi:10.63593/LE.2788-7049.2025.09.004

## Abstract

This study employs a holistic approach to examine the theoretical and practical dimensions of digital procuratorate, aiming to refine its foundational framework within China's legal context. Digital empowerment has significantly advanced procuratorial work by enabling structured progress, diversifying supervision models, and innovating case-handling methodologies. Compared to traditional oversight, it enhances five key dimensions: supervision time (extended coverage), supervision modes (diversified approaches), supervision conditions (improved technical support), supervision functions (expanded scope), and supervision means (advanced tools). Despite these advancements, persistent challenges include underdeveloped digital supervision concepts, fragmented institutional systems, inadequate integration of digital tools, shortages of interdisciplinary talent, and enduring data silos. To systematically propel digital empowerment and foster the legalization, standardization, and institutionalization of digital procuratorate, this study proposes comprehensive optimization strategies: digital proactive supervision, institutional standards systems, the "Three-in-One Inspection" approach, application platforms & models, data-sharing channels, integrated work mechanisms, and interdisciplinary talent development. These recommendations aim to bridge gaps between theory and practice while aligning with China's modernization goals for judicial and social governance.

**Keywords:** digital prosecution, prosecutorial supervision, digital empowerment, social governance, Chinese-style modernization

## 1. Introduction

On December 4, 2024, the Supreme People's Procuratorate (SPP) promulgated the Opinions of the Supreme People's Procuratorate on Comprehensively Deepening Procuratorial Reform and Further Strengthening Procuratorial Work in the New Era, mandating the technological empowerment of legal supervision through the in-depth implementation of the digital prosecution strategy. This initiative aims to modernize procuratorial work by achieving comprehensive digitization across all prosecutorial functions, thereby enabling unified legal oversight (Sheng, 2025). Existing scholarship has examined digital prosecution from macro-level perspectives-including its reform imperatives (Jia, 2023), functional dimensions (Wang, 2023), value objectives (Gao, 2022), relational dynamics (Weng & Shen, 2023), paradigm shifts (Bai & Xu, 2022), and conceptual, technological & methodological transformations (Yu, 2023), while micro-level studies have focused on applications such as smart procuratorial services (Xiang, 2022), digital tools for public interest litigation (Jin & Zhang, 2022), prosecutorial investigations (Wang, 2022), civil execution supervision (Fang, 2023), and juvenile legal supervision (Chen & Cong, 2023). Although these contributions have laid the foundational framework for digital prosecution, their practical systematization remains incomplete, resulting in persistent theory-practice gaps. This paper investigates the operational realities of digital prosecution, seeking to bridge these disparities by proposing actionable solutions to its implementation challenges.

## 2. The Development Context of Digital Empowerment in Prosecutorial Supervision

Reviewing the development context of digital prosecution reveals its current status as a strategic initiative aligned with the era's informatization, digitization, and intelligentization trends. Serving as a cornerstone for strengthening procuratorial legal supervision, this approach empowers nationwide procuratorial organs to leverage the digital revolution. Through transformative innovations in prosecutorial concepts, methodologies, mechanisms, and practices, digital prosecution has emerged as a catalytic force in modern legal oversight. By digitizing legal supervision processes, institutions are actively pioneering new paradigms for prosecutorial modernization, systematically cultivating a digital-driven ecosystem for prosecutorial development. At the macro level, nationwide digital prosecution infrastructure planning is being implemented through phased deployment; at the meso level, case-type supervision scenario modeling applications are undergoing systematic expansion; and at the operational level, legal supervision case-handling frameworks are progressively integrating advanced digital solutions.

### 2.1 Systematic Advancement of Digital Prosecution Construction

In June 2022, the SPP convened a landmark national conference on digital prosecution, formulating a strategic roadmap to accelerate procuratorial digital transformation. This pioneering initiative seeks to revolutionize legal supervision efficiency through systematic digitalization, establishing advanced procuratorial practices as a cornerstone for high-quality economic and social development. Deeply embedded within the national Digital China framework, digital prosecution has organically integrated its guiding principles, strategic objectives, and technological infrastructure, ensuring procuratorial work makes substantive contributions to the Five-sphere Integrated development paradigm. The SPP has spearheaded the formulation of the Outline for Digital Prosecution Construction, a comprehensive blueprint delineating implementation objectives, operational tasks, and institutional safeguards while identifying priority areas. Complementing this, the Digital Prosecution Case Handling Guidelines have curated exemplary case models, serving as standardized references for procuratorial organs nationwide to conduct digital supervision with consistency and efficacy.

Leading procuratorates in Zhejiang, Beijing, Sichuan, and other provincial jurisdictions have implemented progressive policy frameworks to accelerate digital prosecution adoption, including the establishment of dedicated digital prosecution divisions and strategic optimization of human capital. Across China, a comprehensive digital transformation initiative is unfolding through multi-pronged approaches: specialized capacity-building programs, next-generation data application platforms, innovation-driven big data legal supervision competitions, and standardized digital case management protocols. This systematic implementation has yielded measurable outcomes, with big-data-assisted legal supervision cases demonstrating remarkable year-on-year growth that validates the model's scalability. Concurrently, prosecutors nationwide have achieved paradigm shifts in their operational methodologies, collectively signaling the maturation of China's digital prosecution infrastructure and its accelerating trajectory toward modernized legal oversight (Ma, 2023).

### 2.2 Expanding Application of Case-Type Supervision Scenario Modeling

In the realm of digital prosecution, case-type supervision scenario modeling operates through an integrated mechanism combining big-data analytics with prosecutorial review to systematically identify legal oversight opportunities. Nationwide procuratorial organs have institutionalized big-data-driven legal supervision, with particular emphasis on developing scenario-based models in strategic domains to holistically transform the institutional architecture, operational methodologies, and procedural standards of the "Four Major Prosecutions" framework. Through advanced techniques including semantic analysis, keyword clustering, and multidimensional data correlation, prosecutors can efficiently detect batch supervision leads from legal documents and judicial databases. Regional procuratorates are actively deploying AI-powered digital prosecution tools to develop localized scenario applications that address specific governance challenges, thereby establishing automated lead identification, centralized case analysis, and precision-oriented disposition systems. Building upon their dual mandate of judicial oversight and social governance, procuratorates are progressively converting case-type supervision outcomes into actionable "governance scenarios." By implementing standardized model templates and targeted supervision initiatives, they effectively pinpoint intervention points for enhanced societal governance, yielding transformative improvements in priority sectors. Representative achievements include: Beijing Procuratorate's successful filing of 13,000+ cases through big-data supervision models, and Zhejiang Province's mature supervision frameworks (e.g., the "Predatory Lending Fraud Litigation Model" and "Medical Insurance Fraud Monitoring System") that have realized the "pioneering breakthrough-provincewide replication" paradigm, generating significant scaling effects in digital prosecution model deployment (Xu, 2025).

### 2.3 Innovation in Legal Supervision Case-Handling Models

Digital prosecution signifies a comprehensive transformation of traditional legal supervision methodologies, representing not only a disruptive innovation in supervision means but also a systemic reshaping of prosecutorial

workflows, organizational structures, and institutional mechanisms. The conventional paradigm of “passive case acceptance and individual case handling” is undergoing fundamental change: shifting from isolated cases to class-action oversight, from reactive post-facto intervention to proactive governance, and from mere case processing to integrated societal governance. Currently, driven by digital transformation, procuratorial organs leverage technological empowerment to integrate data, models, applications, and platforms. By activating the functional role of “data as a key element” within daily prosecutorial operations, they synergize prosecutorial functions with social governance, achieving significant advancements in supervision efficacy.

Zhejiang’s pioneering digital approach to combating false litigation exemplifies this progress. By analyzing massive civil judgments using criteria such as plaintiff concentration and defendant absence, its procuratorates effectively uncovered numerous “loan sharking” false litigation leads. This resulted in the handling of 2,861 false litigation cases involving over 1.2 billion CNY. The model has since been extended to labor disputes, corporate bankruptcies, insurance claims, and judicial confirmation of mediation/arbitration outcomes. Furthermore, in recent years, Zhejiang procuratorates have applied big data supervision to areas including fiscal subsidy oversight, shell company regulation, and medical insurance fraud, achieving significant outcomes.

### **3. The Mechanisms of Digital Empowerment in Prosecutorial Supervision**

Digital prosecution centers on digitizing core prosecutorial functions, accelerating the development of key scenario-based applications to systematically reshape case-handling mechanisms, methodologies, and tools. By transforming supervision models through digital means, it drives comprehensive reforms in prosecutorial work—enhancing the timing, modes, conditions, functions, and methods of legal oversight.

#### *3.1 Supervision Timing: Terminal Intervention and Front-End Monitoring*

Digital prosecution expands supervisory capabilities from terminal intervention to front-end monitoring, facilitating comprehensive process-wide oversight. While prosecutorial authority, as an exercise of judicial power, inherently maintains restraint and typically focuses on cases with established outcomes, its traditional position at the terminal stage of the legal process chain has limited effectiveness in early case intervention. Big data technology overcomes these temporal constraints by enabling procuratorates to aggregate cross-departmental and cross-sectoral data, thereby identifying supervision leads and monitoring illegal activities in real-time across specific domains. This technological advancement allows for supervision of pre-litigation cases, emerging criminal trends, and systemic issues revealed through data analysis, effectively shifting prosecutorial oversight forward in the legal process.

#### *3.2 Supervision Modes: Passive Oversight and Proactive Enforcement*

Digital empowerment enhances prosecutorial agencies’ proactive capacity, transforming traditionally reactive supervisory models. Whereas most supervisory leads historically originated from post-incident reports or transfers from public security organs—resulting in predominantly passive case acceptance—resource constraints (including imbalanced caseload-to-staff ratios) have limited prosecutors’ ability to conduct comprehensive, proactive oversight. Big data now offers a paradigm shift for proactive enforcement. As a strategic production factor, data inherently contains latent supervisory leads. By applying big data analytics aligned with the “Four Major Prosecutorial Functions,” prosecutors can systematically screen cross-domain datasets to identify actionable oversight clues. These data-derived leads are then refined to a manageable scale for targeted manual verification, significantly enhancing oversight precision and enabling the crucial transition from passive case acceptance to proactive legal enforcement (Zhang, 2024).

#### *3.3 Supervision Conditions: Constrained Resources and Collaborative Data Governance*

Digital empowerment creates an interoperable data ecosystem that strengthens internal-external coordination in prosecutorial oversight. In this “Internet of Everything” era, multi-source data resources provide prosecutorial bodies with novel case-handling perspectives and operational advantages, signifying the transition from mere “digitized operations” to true “operationalized data.” The supporting data infrastructure now extends beyond internal departmental sharing or inter-jurisdictional exchanges within judicial authorities, fostering a cross-sectoral legal data environment that systematically breaks down traditional silos based on institutional functions. Digital case processing requires both prosecutorial system data and externally managed datasets from partner agencies, demonstrating the interdisciplinary nature of data interoperability and its inherent operational synergies—facilitating both data integration and workflow harmonization across departments. Through data-driven supervision protocols, prosecutorial organs establish operational consensus with supervised entities and data providers. These protocols are embedded within digital collaboration frameworks to proactively identify, warn against, and mitigate recurring violations, ultimately achieving coordinated governance effectiveness.

#### *3.4 Supervision Function: Case Handling and Social Governance*

Digital empowerment elevates prosecutorial supervision from individual case resolution to comprehensive social governance. Through big data analytics, prosecutors can detect systemic patterns across similar cases—patterns that frequently uncover underlying societal issues demanding collaborative interventions. As empowered by the Provisions on Prosecutorial Suggestions by People's Procuratorates, prosecutorial oversight now transcends isolated case handling to address root causes via systemic case management. This data-driven approach significantly expands the jurisdictional scope of supervisory authority, creating cross-sector societal impacts that move beyond traditional case-by-case adjudication. Digitally enhanced prosecutorial supervision enables prosecutors, as state actors, to actively engage in social governance. Their role transforms from discrete case interventions to holistic systemic oversight, thereby improving administrative efficiency, optimizing public service delivery, and enhancing social stability—ultimately accelerating the development of a rule-of-law society.

### *3.5 Supervision Methods: Digital Models and Information Technology*

Digital empowerment provides prosecutorial supervision with innovative, multi-dimensional tools. The Digital Procuratorate initiative represents the modernization of prosecutorial work for the digital age, strategically employing data analytics and digital technologies to enhance both operational efficiency and supervisory effectiveness. Rather than constituting a standalone prosecutorial category, it serves as an integrated methodology that aligns technological solutions with core legal functions—ensuring technology serves substantive justice needs rather than operating in isolation. By synthesizing internal prosecutorial data with external datasets, prosecutors develop sophisticated big data supervision frameworks that combine cutting-edge information technology with specialized management platforms. These systems employ advanced data aggregation, correlation analysis, and pattern recognition to identify systemic legal issues across caseloads. Such digital transformation emancipates prosecutors from labor-intensive manual case reviews while resolving persistent challenges including workflow fragmentation and supervisory lead detection limitations. Ultimately, this technological integration creates transformative mechanisms for proactive execution of prosecutorial mandates.

## **4. Practical Constraints in Digitally Empowered Prosecutorial Supervision**

Digitally empowered prosecutorial supervision faces significant practical challenges that impede the effective advancement of Digital Procuratorate initiatives. Subjectively, prosecutorial personnel lack a fully developed digital oversight mindset. Structurally, the institutional framework for digital prosecutorial supervision remains underdeveloped. Operationally, existing implementations of digital prosecution models operate superficially with limited substantive depth. Personnel constraints reveal an acute shortage of multidisciplinary talent proficient in both legal practice and technological application. Objectively, persistent digital barriers—manifested through data silos and systemic interoperability deficits—continue to impede progress across all fronts.

### *4.1 Incomplete Formation of Digital Supervision Mindset*

The advancement of digitally empowered prosecutorial supervision continues to face constraints from traditional operational paradigms, where prosecutors predominantly maintain passive case acceptance and reactive oversight approaches, demonstrating limited initiative in leveraging digital technologies for legal supervision. Many prosecutorial professionals neither fully grasp the functional transformation required for digital procuratorial work nor adequately appreciate the profound societal adaptations necessitated by rapid technological evolution. This cognitive deficit translates into insufficient historical urgency to develop big data competencies. When combined with the lack of external support systems and performance incentives, these factors result in weak motivation for adopting digital workflows, including resistance to mastering data modeling and supervision algorithm applications. The cumulative effect manifests in suboptimal data utilization, inadequate cross-domain implementation, and a paucity of high-impact innovations—revealing systemic deficiencies in aligning prosecutorial functions with contemporary social governance frameworks.

### *4.2 Institutional Deficiencies in Digital Procuratorial Supervision*

The deepening implementation of digital procuratorial reforms has exposed systemic deficiencies, where undefined institutional frameworks and inadequate legal foundations have led to borderline-compliant data practices, generating ongoing debates about the legitimacy of data acquisition and utilization methods. While local procuratorates have actively explored digital transformation in response to the Supreme People's Procuratorate's strategic directives, current practices lack a cohesive, scientifically-validated regulatory system that includes: standardized case-handling procedures specifically designed for digital supervision; management mechanisms supporting the "service-oriented, data-integrated, technology-driven, application-focused" operational model; and comprehensive legislative infrastructure covering development roadmaps for digital procuratorial systems, evidentiary standards for data-based prosecutorial work, and clear organizational accountability measures. This institutional fragmentation is further aggravated by a shortage of normative

documents to systematically guide digital procuratorial development, resulting in piecemeal policies that compromise the system's overall coherence (Li, 2023).

#### *4.3 Insufficient Depth in Digital Procuratorial Model Implementation*

The current implementation of digital procuratorial models demonstrates inadequate operational depth and significant regional disparities in development. Although procuratorial authorities have established multiple digital supervision frameworks, their practical efficacy remains constrained by three key factors: superficial departmental exploration, insufficient emphasis on core legal oversight functions, and poor interdepartmental coordination. Most models prove incapable of producing actionable supervision cases, yielding negligible legal oversight results and minimal systemic impact. While a few key supervision models have shown measurable success, their limited quantity and absence of standardized operational protocols hinder broader adoption and scalability. Additional shortcomings include passive departmental participation, ineffective external data acquisition coordination, and failure to develop high-impact digital procuratorial precedents—collectively revealing fundamental weaknesses in integrated advancement mechanisms for digital legal oversight (Zhang, 2025).

#### *4.4 Shortage of Interdisciplinary Digital Procuratorial Talents*

The persistent shortage of interdisciplinary talent in digital procuratorial work continues to pose significant operational challenges, particularly in prosecutors' data collection and analytical capacities. Technical obstacles in procuratorial data analysis primarily stem from inter-disciplinary dataset conflicts, where extracting high-value correlated information demands sophisticated IT infrastructure—a capability currently lacking in numerous jurisdictions. This “Internet and Procuratorial Work” era has created unprecedented demand for professionals equally proficient in data science and legal supervision, yet the supply of such dual-qualified experts remains critically insufficient (Shen & Lu, 2019). The current workforce composition reveals a fundamental disconnect: while most procurators possess conventional legal training but lack computational competencies, technical staff within the system typically demonstrate limited substantive legal knowledge. This professional dichotomy creates operational friction in case processing and legal oversight functions. Most critically, the talent gap directly undermines the integrated development of examination, investigation, and detection capabilities (the “three-in-one” supervisory model), urgently necessitating comprehensive reforms in talent cultivation mechanisms to bridge the growing digital-legal divide (Wang, 2023).

#### *4.5 Data Barriers Persist Long-Term in Digital Procuratorial Work*

Data barriers in procuratorial work principally emerge as institutional data-sharing challenges between procuratorial organs and external entities, typically characterized by reluctance, hesitation, or technical incapacity to share information. These barriers perpetuate fragmented data silos across information systems. At the macro level, regional data-sharing ecosystems remain immature due to the absence of standardized exchange protocols, comprehensive management frameworks, and unified technical platforms. On the micro level, institutional resistance—stemming from both subjective factors (lack of organizational initiative) and objective limitations (technological constraints)—creates uneven data accessibility, with most datasets categorized as either “restricted sharing,” “conditionally open,” or “non-sharable.” Grassroots procuratorates consequently grapple with unreliable data supply chains and operational mismatches between data needs and availability. Compounding these issues, incompatible interfaces among departmental office systems obstruct automated data transfers, necessitating labor-intensive manual processes that ultimately impede the development of interconnected data networks crucial for effective legal supervision (Hu, 2025).

### **5. Optimization Pathways for Digitally Empowered Procuratorial Supervision**

The modernization of state and social governance necessitates a paradigm shift toward rule-of-law-based, specialized, socialized, and intelligent approaches. Under the guiding principle of “proactive procuratorial work in full compliance with legal provisions,” prosecutorial authorities must embrace digital empowerment as the cornerstone of legal supervision. This transformation requires establishing comprehensive statutory frameworks, standardized supervisory protocols, and streamlined case-handling procedures for digital procuratorial operations, coupled with accelerated development of supporting digital infrastructure. By implementing these strategic measures, procuratorial organs can achieve qualitative development and transformative efficiency gains, thereby making substantive contributions to the modernization of national governance systems.

#### *5.1 Establishing a Digitally Proactive Supervision Doctrine*

Prosecutors must fully adopt the paradigm of digitally empowered proactive supervision, actively participating in digital procuratorial initiatives to strengthen operational dynamism. Recognizing digital procuratorial work as the critical catalyst for high-quality legal oversight, practitioners must develop strategic foresight regarding the impending modernization leap in prosecutorial functions. To achieve substantive justice in law enforcement, prosecutorial organs must harness big data and emerging digital technologies to unlock the full operational

potential of legal data, moving beyond superficial approaches when addressing complex supervisory challenges. In confronting the enduring obstacles of limited evidence-collection channels and evidentiary acquisition difficulties in traditional case oversight, comprehensive improvements must be implemented: optimizing digital procuratorial platform infrastructure, building robust elemental systems, enhancing functional capabilities, and fostering innovative operational models. This systemic advancement will position data empowerment as the transformative engine driving qualitative, efficient, and dynamic evolution in prosecutorial practice.

Prosecutors must fundamentally comprehend how the digital revolution inherently transforms contemporary prosecutorial paradigms—driving innovation in conceptual frameworks, methodological approaches, and operational mechanisms. To meet digital-era imperatives, they must fully embrace the governing principle that “digital empowerment facilitates supervision, while effective supervision propels governance,” actively leveraging big data analytics to enhance legal oversight. This data-driven approach implements comprehensive pattern monitoring through five key dimensions: case analysis, element classification, model development, systematic governance, and integrated supervision. By adopting this methodology, prosecutorial practice achieves transformative breakthroughs in supervisory efficacy through strategic digital paradigm transitions.

## *5.2 Improving the Institutional Framework for Digital Procuratorial Standards*

### *5.2.1 Refining Case Handling Protocols for Digital Procuratorial Work*

As an emerging big-data-driven legal supervision paradigm that fundamentally transforms traditional prosecutorial methods through technological innovation, digital procuratorial practice must develop comprehensive operational guidelines rooted in conventional supervisory frameworks while emphasizing data-driven mechanisms. Current regulatory frameworks require substantive augmentation to address digital-specific characteristics and core prosecutorial principles, particularly through formalizing the legal basis for pattern supervision with explicit provisions regarding: fundamental responsibilities, jurisdictional parameters, standardized data collection protocols, evidentiary governance, and uniform workflows for analogous case processing (Li, 2024). Simultaneously, these regulatory enhancements must maintain appropriate judicial restraint by clearly delineating the boundaries of proactive prosecutorial actions, specifically defining the relationship between mandatory obligations and discretionary enforcement while instituting robust safeguards against jurisdictional overreach.

### *5.2.2 Developing Cross-Domain Operational Synergy Systems*

To realize holistic integration of digital case management across the Four Major Prosecutorial Functions (Criminal, Civil, Administrative, and Public Interest) while embedding legal oversight throughout litigation workflows, a coordinated institutional framework must be systematically developed. This framework should incorporate: (1) interoperability standards for big-data supervision systems; (2) governance protocols for legal model applications; (3) benchmark repositories of exemplary digital oversight cases; and (4) technology-driven workflow assessment metrics. Together, these components will facilitate standardized implementation and operational excellence across all prosecutorial service domains, ensuring consistent digital transformation while maintaining rigorous legal oversight.

### *5.2.3 Implementing Tiered Data Security Governance Protocols*

Prosecutorial authorities must implement robust data governance through a comprehensive quadruple-standardization framework, covering: (1) data sharing protocols, (2) business process regulations, (3) technical implementation standards, and (4) security operation requirements. This framework operationalizes cybersecurity accountability systems while enforcing classified data protection measures and confidential information classification schemes. End-to-end security safeguards must be strengthened, including network perimeter defense, authenticated data interchange mechanisms, encrypted transmission pathways, and terminal device protection protocols—ensuring absolute data integrity throughout all prosecutorial operations (Liang, 2024).

### *5.2.4 Advancing Interagency Judicial Data Interoperability*

Through established interagency collaboration frameworks encompassing law enforcement agencies, judicial bodies, administrative authorities, industry associations, and corporate entities, systemic information-sharing barriers will be systematically eliminated. This will be achieved via codified regulations that clearly define: (1) data provider obligations, (2) scope limitations for shared materials, (3) authorization protocols, and (4) standardized access procedures. Parallel infrastructure development will facilitate consolidated data asset management through four key processes: standardized aggregation, quality-controlled cleansing, multi-source data fusion, and comprehensive metadata cataloging. This integrated approach creates reciprocal synergies whereby internal prosecutorial digitization simultaneously drives and benefits from external smart governance convergence across society.

### *5.3 Deepening the Integrated Application of Review, Investigation, and Detection Methods*

The essence of digital case handling lies in leveraging technological empowerment to transform prosecutorial oversight from individual case resolution to categorical supervision and systemic governance. This paradigm shift utilizes big data analytics to identify oversight patterns across case categories, employing integrated supervision methodologies and holistic governance approaches to address persistent challenges including lead aggregation difficulties, categorical case management deficiencies, fragmented oversight mechanisms, and ineffective social governance interventions. The comprehensive implementation of the “Procuratorial Big Data Strategy” requires adherence to the “Triple-Method Fusion” principle: digital case review findings must undergo investigative verification, supplemented when necessary by detection-oriented methodologies. This intelligence-driven approach synergizes three core processes: (1) analytical review (including data examination) defining investigative scope, (2) field verification validating digital insights, and (3) forensic techniques overcoming evidentiary challenges—achieving unified integration in case-handling cognition, methodology, and resource allocation to optimize multidimensional oversight effectiveness. Consequently, big-data-identified leads demand the convergence of “data thinking” (expanding analytical parameters), “legal thinking” (identifying jurisdictional opportunities), and “detection thinking” (resolving evidentiary complexities). Prosecutorial organs conducting big-data casework must fully integrate internal departmental functions, harnessing combinatorial advantages through cross-departmental coordination and multi-tier collaboration. Data-sharing infrastructure must transcend organizational silos, institutionalizing coordinated case handling through vertical integration and joint operations, thereby requiring all prosecutorial divisions to align their mandates for unified action.

### *5.4 Proactively Exploring Big-Data Application Platforms and Oversight Model Development*

The development of big-data legal oversight platforms should be systematically implemented through coordinated deployment of digital supervision models across procuratorial agencies, following the principles of collaborative data development, shared utilization, and integrated management. This phased implementation will establish provincial-level and higher big-data prosecutorial oversight platforms featuring unified core functions such as centralized data governance, collaborative modeling, and standardized deployment—effectively preventing redundant development and system fragmentation. The Supreme People’s Procuratorate will oversee the research, development, and administration of a national-level big-data legal oversight model management platform, adopting an open-source approach for authorized service providers to foster a sustainable ecosystem based on prosecutorial leadership, multi-party co-creation, and mutually beneficial partnerships. Provincial procuratorates will lead the construction of foundational platform architectures within their jurisdictions, providing subordinate units with comprehensive support including: data infrastructure resources, standardized development frameworks, user-friendly online modeling tools for frontline personnel, regulated external data import capabilities, and analytical algorithms to enable effective big-data prosecutorial oversight, systematic case evaluation, and comprehensive statistical analysis. While maintaining essential data interoperability standards, municipal and county-level procuratorates may conduct regulated data access and governance operations to improve both data collection efficiency and utilization precision, thereby maximizing practical application outcomes. Platform development and management must holistically incorporate internally generated prosecutorial data while progressively expanding external data resources, systematically aggregating public datasets, and strategically leveraging internet-derived information assets (Wang, 2025).

The systematic advancement of big-data legal oversight platforms requires coordinated implementation of digital supervision models across prosecutorial agencies, grounded in the principles of collaborative data development, shared utilization, and unified governance. This phased rollout will establish provincial and national-level prosecutorial oversight platforms featuring standardized core functionalities encompassing: (1) centralized data governance, (2) collaborative modeling ecosystems, and (3) modular deployment frameworks—effectively eliminating redundant development while ensuring system interoperability. The SPP shall exercise centralized oversight for the national big-data legal oversight platform, encompassing research, development, and administration responsibilities. Through regulated open-source access for authorized providers, this initiative will cultivate a sustainable digital ecosystem founded on three pillars: prosecutorial governance, multi-institutional co-creation, and value-driven partnerships.

Provincial procuratorates will spearhead foundational platform development within their jurisdictions, delivering comprehensive support infrastructure including:

- Standardized data architecture and storage solutions
- Modular platform development kits
- Intuitive online modeling interfaces for operational staff
- Secure external data integration channels
- Advanced analytical algorithms for case evaluation and statistical modeling

Municipal and county-level agencies shall maintain essential data interoperability standards while implementing localized data governance protocols to enhance both collection efficiency and analytical precision. Platform management must holistically incorporate four critical data dimensions: (1) internal prosecutorial case data, (2) expanded external legal resources, (3) systematically curated public datasets, and (4) strategically harvested internet-derived intelligence assets (Ma, 2024).

#### *5.5 Establishing Smooth Internal and External Data-Sharing Channels*

The successful implementation of big-data legal supervision fundamentally depends on establishing comprehensive mechanisms for acquiring and integrating both internal and external data sources. This necessitates systematic improvements in data source governance and the removal of institutional barriers to external data access. A rigorous assessment must first be conducted to identify and categorize the essential data types and parameters required for effective prosecutorial oversight. Procuratorial authorities should actively engage central government agencies, political-legal entities, and administrative departments to develop standardized regulations that establish clear data-sharing protocols and operational frameworks, thereby facilitating collaborative data acquisition initiatives. Furthermore, strategic partnerships must be cultivated across three critical dimensions: (1) institutional data sharing, (2) technical infrastructure development, and (3) analytical model innovation, ensuring a coordinated approach to building robust big-data supervision capabilities.

A dual-track approach must be implemented for prosecutorial data integration. Internally, prosecutorial data requires systematic consolidation through standardized collection methods and uniform quality criteria. Externally, a comprehensive data catalog must be developed to facilitate secure acquisition of authorized datasets from political-legal institutions and administrative agencies, while gradually integrating regulated public social data sources. The key to this process is the standardization of data interfaces to ensure seamless system interoperability. Through this holistic management of both internal and external data resources, legal supervision models will gain substantial analytical support. The data aggregation infrastructure requires comprehensive upgrading via three parallel initiatives: legislative framework enhancements, institutional mechanism innovations, and technical platform development—collectively enabling efficient, secure prosecutorial data sharing across all operational dimensions.

#### *5.6 Refining the Integrated Mechanism for Digital Prosecutorial Work*

Digital prosecutorial work constitutes a paradigm-shifting transformation in contemporary legal oversight, representing both a methodological revolution and technological evolution in procuratorial practice. As an emerging discipline still in its formative stage, this innovation demands robust top-down institutional governance and comprehensive coordination mechanisms to ensure systematic development. By strengthening digital prosecutorial competencies across all operational dimensions, the legal system can achieve holistic improvements in case-handling quality, oversight efficiency, and overall judicial effectiveness—ultimately realizing the full potential of technology-enhanced legal governance.

##### *5.6.1 Refining the Integrated Organizational Leadership Mechanism*

Procuratorial organs at all levels must establish specialized leadership groups and dedicated digital prosecution offices to systematically coordinate, guide, and implement digital transformation initiatives. These entities should institutionalize cross-functional communication protocols and collaborative mechanisms to strengthen centralized governance and organizational synergy. Such structural enhancements will optimize operational efficacy across key domains including data analytics management, application development, and the deployment of digital supervision models. Through this framework, procuratorial organs can reinforce integrated, comprehensive, and proactive execution of legal mandates, thereby consolidating a unified enforcement capacity that meets the demands of modern legal oversight.

##### *5.6.2 Refining the Business-Led and Technology-Supported Collaboration Mechanism*

Business units must take the lead in four critical dimensions of legal supervision modernization: (1) identifying model requirements, (2) conducting project evaluations, (3) overseeing application deployment, and (4) coordinating data integration, while simultaneously advancing data governance frameworks and model development initiatives. Concurrently, technical divisions within procuratorial authorities are responsible for establishing core platform infrastructure and providing technical safeguards for standardized models. By ensuring seamless technological interoperability, these technical teams deliver comprehensive support that empowers business units to both refine existing models and develop localized adaptations, thereby addressing region-specific operational requirements while maintaining systemic coherence across jurisdictions.

##### *5.6.3 Refining the Digital Case Handling Command Mechanism*

A centralized command-and-dispatch system must be implemented to achieve unified coordination for critical

model applications and major case processing, encompassing strategic command, operational synchronization, and resource allocation. This system will provide targeted guidance to resolve persistent bottlenecks, technical challenges, and implementation obstacles in model development and deployment, strictly adhering to integrated enforcement principles to optimize operational synergy. The command center will holistically manage four core dimensions: (1) digital transformation initiatives, (2) cross-departmental case coordination, (3) evidentiary lead distribution and supervision, and (4) standardized operational guidance across all business units. Through this framework, prosecutorial authorities will significantly strengthen interdepartmental collaboration, establish robust horizontal integration mechanisms, and ultimately elevate the overall effectiveness of legal oversight operations (Song & Sun, 2024).

#### *5.7 Cultivating Interdisciplinary Talents for Digital Prosecutorial Work*

The successful realization of digital prosecutorial strategic objectives fundamentally depends on cultivating a new generation of interdisciplinary legal-technical professionals. To ensure sustainable development of digital prosecutorial initiatives, comprehensive reforms must be implemented in talent cultivation mechanisms and human resource management systems, thereby establishing robust intellectual support frameworks and strategic human capital reserves that can meet the evolving demands of technology-driven legal oversight.

##### *5.7.1 Enhancing Training and Education*

To accelerate Digital China initiatives and advance prosecutorial modernization, comprehensive training programs and awareness campaigns must be intensified to cultivate three critical dimensions of digital proficiency among prosecutors: (1) strategic digital mindset development, (2) operational digital awareness enhancement, and (3) technical competency building. This multifaceted approach will systematically strengthen case-handling teams' adaptive capabilities, innovative problem-solving skills, and practical application competencies in digital environments, thereby bridging the gap between legal expertise and technological demands in contemporary prosecutorial practice.

##### *5.7.2 Prioritizing the Selection and Cultivation of Interdisciplinary Digital Prosecutorial Talents*

To proactively meet the evolving requirements of digital prosecutorial transformation, talent development frameworks must be strategically optimized through synergistic collaboration between three key stakeholder groups: experienced prosecutorial practitioners, technical specialists, and subject matter experts. This optimization will be achieved through multifaceted capacity-building initiatives including demonstration sessions, professional skill competitions, and hands-on training workshops—all designed to accelerate the cultivation of interdisciplinary professionals. Special emphasis will be placed on developing personnel with dual competencies in legal operations and digital technologies, while systematically establishing two critical support systems: comprehensive digital prosecutorial expert panels and specialized talent databases to sustain long-term capability development (Yuan & Wang, 2024).

##### *5.7.3 Strengthening the Development of Digital Prosecutorial Case Handling Teams*

To strengthen the cultivation of innovative, application-oriented digital prosecutorial teams, we must prioritize collaborative synergy in case-handling practices. This strategy will systematically bridge prosecutorial expertise with technological and data-driven capabilities while actively fostering the development of interdisciplinary teams specializing in innovative solutions and practical applications. The ultimate objective is to establish a sustainable talent ecosystem supporting digital prosecutorial transformation and advanced data model analytics.

## **6. Conclusion**

This study demonstrates how digital empowerment revolutionizes China's procuratorial work by enhancing five key dimensions: temporal (front-end monitoring), modal (proactive enforcement), conditional (data collaboration), functional (societal governance), and methodological (advanced tools). Despite progress, challenges persist in digital adoption, institutional coherence, model implementation, talent development, and data integration. The proposed optimization framework includes: (1) doctrinal shift toward proactive digital supervision; (2) institutional standardization of legal protocols and cross-domain synergy; (3) methodological integration of review-investigation-detection techniques; and (4) platform development through centralized big-data governance. These strategies collectively advance China's prosecutorial modernization, bridging theory-practice gaps while strengthening rule-of-law and social governance in the intelligentization era.

## **Statements and Declarations**

The authors would like to state that there is no conflict of interest and that no funding has been invested on this research.

## **References**

- Bai, X. and Xu, K., (2022). Exploration of New Paradigms in Digital Prosecution Legal Supervision. *People's Procuratorial Semimonthly*, 21, 32-36.
- Chen, W. and Cong, L., (2023). Multi-dimensional Discussion on Digital Empowerment of Juvenile Prosecutorial Legal Supervision. *Chinese Prosecutors*, 11, 8-12.
- Fang, H., (2023). Prosecutorial Practice of Digital Empowerment in Civil Execution Supervision. *People's Procuratorial Semimonthly*, 5, 53-56.
- Gao, J., (2022). The Value Objectives and Practical Path of Digital Prosecution. *China Law Review*, 6, 35-48.
- Hu, C., (2025). Digital Prosecution in the Context of Modernization of National Governance System. *Journal of East China University of Political Science and Law*, 1, 45-58.
- Jia, Y., (2023). On Digital Prosecution. *China Legal Science*, 1, 5-24.
- Jin, S. and Zhang, Y., (2022). Practical Exploration of Digital Technology Assisting Public Interest Litigation Prosecution. *Chinese Prosecutors*, 3, 15-18.
- Li, K., (2024). Research on the Collaborative Relationship between Judicial Power and Administrative Power in Environmental Pollution Governance. *Journal of Jiangxi University of Science and Technology*, 45(5), 43-50.
- Li, X., (2023). Big Data Expanding the Investigation Supervision: Progress and Prospects. *Journal of East China University of Political Science and Law*, 5, 32-44.
- Liang, H., (2024). Digital Prosecution Empowering Administrative Public Interest Litigation: Logic, Concerns and Development. *Academic Exchange*, 5, 45-58.
- Ma, C., (2023). The Generative Logic, Practical Paradigm and Development Orientation of Digital Prosecution. *Journal of China University of Political Science and Law*, 6, 242-254.
- Ma, C., (2024). The Legal Boundaries of Digital Justice. *Oriental Law*, 4, 127-142.
- Shen, L. and Lu, C., (2019). On the Comprehensive Construction and Application of Prosecutorial Business Data Analysis Platform Based on Big Data. *Journal of Shanghai Law Research*.
- Sheng, Y., (2025). Shanghai Paradigm: The Positioning and Development of Digital Prosecution. *Journal of National Prosecutors College*, 33(2), 45-59.
- Song, Y. and Sun, P., (2024). An Examination of the Narrative Discourse and System of Juvenile Justice Procuratorate. *Journal of National Prosecutors College*, 6, 76-96.
- Wang, L., (2023). The Chinese Landscape of Intelligent Technology Empowering Political and Legal Reform. *Science of Law (Journal of Northwest University of Political Science and Law)*, 5, 12-31.
- Wang, H., (2025). The Dilemma and Breakthrough of Digital Transformation in Legal Supervision. *Oriental Law*, 1, 90-103.
- Wang, Q., (2022). The Approach of Digital Empowerment in Prosecutorial Investigation. *People's Procuratorial Semimonthly*, 13, 26-31.
- Wang, Y., (2023). Digital Prosecution: The Era Requirement for Legal Supervision. *People's Procuratorial Semimonthly*, 3, 5-11.
- Weng, Y. and Shen, Y., (2023). Ten Relationships in Digital Prosecution Work. *People's Procuratorial Semimonthly*, 1, 53-61.
- Xiang, J. (2022). The Practical Background and Deepening Path of Digital Prosecution. *Chinese Prosecutors*, 9, 19-22.
- Xu, T., (2025). The Logic and Path of Digital Empowerment in Arrest Social Risk Assessment. *Journal of Henan University of Economics and Law*, 2, 40-54.
- Yu, Z., (2023). The Tiered Configuration and Depth Function of Digital Prosecution. *Science of Law (Journal of Northwest University of Political Science and Law)*, 41(4), 94-103.
- Yuan, M. and Wang, X., (2024). On the Collaborative Interactive Prosecutorial Supervision Model in the Digital Era. *Journal of Zhejiang Gongshang University*, 6, 87-97.
- Zhang, D., (2024). The Boundary of Rule of Law in Digital Procurement. *Journal of Lanzhou University (Social Sciences)*, 2, 77-87.
- Zhang, D., (2025). The Logic, Risks and Governance of Digital Prosecution. *Social Sciences in Yunnan*, 1, 31-39.

**Copyrights**

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).