

From Technological Superposition to Institutional Reshaping: Research on Digital Empowerment and Mechanism Innovation of Law-enforcement Case-handling Management Centers in the Context of Intelligence

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Abstract: The Law-enforcement Case-handling Management Center stands as a milestone initiative to push forward standardized public security law-enforcement work. Now that these centers have been set up across the whole country, the core work focus has shifted from building basic facilities to making full use of existing operational systems. Digital tools such as big data and artificial intelligence are changing how these institutions operate, and their influence goes far beyond simply putting different functional spaces together. Drawing on real-world practices from multiple local regions, this paper sorts out practical attempts in digital empowerment and explores feasible routes for institutional innovation. It also sorts out existing bottlenecks including poor practical adaptability of technical tools and persistent data isolation, and puts forward targeted suggestions to help these centers shift from merely stacking technical tools to carrying out thorough institutional reform.

1. Research Background

The Law-enforcement Case-handling Management Center is an important reform project rolled out by the Ministry of Public Security to advance law-based public security governance. It brings comprehensive adjustments to public security organs' ideas, working modes and workflow for law-enforcement work. The first center came into operation under Haidian Branch of Beijing Public Security Bureau in 2015, and this reform has been carried out for roughly ten years. Through years of continuous improvement, such centers have spread to every corner nationwide, growing from scratch to achieve full geographic coverage. At this stage, policy-making departments are no longer focused on completing institutional construction, but on ensuring these centers can function effectively. Wang & Liu hold that after achieving full nationwide coverage, authorities need to study whether deeper-level application is viable and necessary, look into real-world operating conditions, and strive for intensive utilization and better practical performance^[1].

At the same time, digital technologies represented by big data, artificial intelligence and the Internet of Things are greatly altering the forms and underlying logic of law-enforcement case-handling. Public security bodies all over China are actively exploring new police work modes summarized as “specialized expertise plus institutional mechanisms plus big data”. With law-enforcement case-handling management centers as the main carrier, public security departments are promoting deeper integration between digital technologies and routine law-enforcement work. Facial recognition, intelligent early warning, data modeling and other technical means have been widely applied, pushing these centers from simple physical combination of different functional areas toward genuine functional integration.

Even so, simply embedding technical systems into daily work cannot automatically improve institutional performance. Zhuang & Li have pointed out that public security law-enforcement administration still faces noticeable problems: outdated law-enforcement mindsets, unsatisfactory supervision results, and an urgent need to improve the practical performance of law-enforcement case-handling management centers^[2]. Two practical questions remain to be answered: how can digital empowerment help us move past simple technical overlay and realize institutional reshaping? How can intelligent technical tools bring about lasting improvements in law-enforcement outcomes? Both questions require further theoretical sorting and practical research. Centered on digital empowerment and mechanism innovation of law-enforcement case-handling management centers under intelligent reform trends, this paper analyzes the institutional logic behind technology-driven law-enforcement, sorts out real-world obstacles in intelligent operation, and offers optimized ideas for mechanism innovation.

2. Practical Patterns of Digital Empowerment for Law-enforcement Case-handling Management Centers

2.1 Comprehensive Deployment of Intelligent Hardware Facilities

In actual work, local centers have built relatively complete sets of intelligent hardware equipment. Facial-recognition systems support instant identity verification and full-process tracking of criminal suspects. Once suspects complete registration procedures inside the center, they will be tracked throughout all relevant links. Information only needs to be entered one time, and can be accessed across multiple terminals. Integrated information-collection stations can finish physical inspection and fingerprint collection within ten minutes, and complete real-time data comparison. Intelligent interrogation systems are fitted with integrated interrogation desks, synchronous audio-video recording functions and automatic speech-to-text conversion functions. A small number of well-equipped centers have also introduced cutting-edge devices such as robots for physical-evidence management.

For example, the Law-enforcement Case-handling Management Center under Chengdu Hi-tech Zone Public Security Sub-bureau has installed facial-recognition access gates. Robots guided by laser navigation work together with flexible six-axis mechanical arms, supported by digital chips for real-time precise positioning. The whole set-up forms a closed-loop digital supervision system covering physical-evidence storage, safekeeping, transfer and retrieval, lifting transfer efficiency by 30 percent. IoT-based intelligent case-management cabinets have replaced traditional drawer-style file storage equipment. Zhifu Branch of Yantai Public Security Bureau makes use of intelligent monitoring devices. The system will send automatic alerts when suspects take high-risk actions such as trying to climb barriers, falling over or attempting to run away. Changchun Public Security Bureau has put in place a four-dimensional structured modeling system. It takes facial features, gait, body posture and clothing characteristics as identification dimensions, so staff can spot suspects' abnormal movements and respond immediately. Yongkang Public Security Bureau has worked

together with technical research institutions to develop a special monitoring system for case-handling zones, which can send precise early warnings for various abnormal incidents.

2.2 Construction and Integration of Data Platforms

Real-world intelligent operation relies heavily on data aggregation and platform integration. Most local centers have built comprehensive management platforms covering multiple functional modules: law-enforcement case-handling information management, intelligent video early-warning, physical-evidence administration and intelligent dossier management.

Tianjin Public Security Bureau has formulated a quality evaluation system containing 277 specific indicators. Large-screen display devices inside centers show real-time case-handling progress from grassroots police stations in each district. In this way, traditional manual post-event inspection work has given way to digital records generated right from the start of police response. Shijiazhuang Public Security Bureau supports online processing for 81 business items falling under nine major categories. Jiaozhou Public Security Bureau runs four special platforms to carry out all-round, round-the-clock intelligent management for detained persons, case progress, physical-evidence safekeeping and file circulation. Public security departments in Beijing adopt unified data management standards. They integrate case handling, case review, service provision, as well as physical-evidence safekeeping, transfer and disposal into a complete online working loop. Fuyang Branch of Hangzhou Public Security Bureau breaks down data barriers between public security, procuratorate, court and judicial-administrative organs through a digital political-legal coordination platform, enabling electronic circulation of criminal case files. Dongchangfu Branch of Liaocheng Public Security Bureau positions its law-enforcement case-handling management center as a key data gathering node. It moves research and judgment work forward to the center, grants on-site police officers high-level data access authority, and connects different public security information systems.

2.3 Development and Operation of Intelligent Supervision Models

Intelligent supervision represents one core function brought by digital empowerment. Local public security departments have explored multiple practical intelligent supervision modes. Jiaozhou Public Security Bureau has built law-enforcement risk early-warning models. The system keeps automatic watch over key supervision points, sends reminders for approaching case-handling deadlines, gives alerts for abnormal data, and tracks rectification work for detected law-enforcement flaws. Public security bodies in Chongqing have built a full-process closed-loop supervision system covering police response, case filing, investigation and evidence collection, compulsory measures, case closing and cross-department political-legal coordination. Shijiazhuang Public Security Bureau develops risk-warning models targeting core law-enforcement elements including personnel, cases, physical evidence, police alerts, dossiers and working venues. It can review case data in digital form without manual on-site intervention. Relying on IoT-enabled intelligent management, Dongchangfu Branch of Liaocheng Public Security Bureau realizes automatic alerts for abnormal situations, shifting safety management from manual human watch-keeping toward technology-supported prevention. Yongkang Public Security Bureau installs front-end sensing devices in its monitoring system. These devices collect real-time data about personnel inside case-handling zones without disturbing on-site work, and pop-up warnings will appear within seconds once abnormal conditions are captured.

3. Operational-mechanism Innovation Driven by Digital Empowerment

3.1 Intelligent Transformation of Supervision and Administration Mechanisms

Traditional law-enforcement supervision mainly depends on post-event review and manual inspection. Such working patterns suffer from obvious time lags and fragmented supervision coverage. Digital empowerment brings three major changes to supervision mechanisms. First, supervision work shifts from “correcting mistakes after incidents” to “preventing risks in real time”. After suspects enter the center, all investigation activities take place within designated areas with full-process audio-video recording. Interrogation records are uploaded to the system instantly, and case approval procedures are completed online. The Law-enforcement Case-handling Management Center of Tianjin Public Security Bureau moves supervision work forward to earlier links. It collects and checks information of all newly registered cases every day. On-site staff can offer timely support in defining jurisdiction scope, procedural review, interrogation guidance, risk early warning and legal standard application, so as to eliminate law-enforcement risks in a dynamic manner. Supported by artificial-intelligence-based early-warning models, Putuo Branch of Shanghai Public Security Bureau can detect, alert and handle irregularities almost instantly.

Second, management mode evolves from “supervision between individual police officers” to “case governance supported by data”. Intelligent models can identify law-enforcement problems and hidden risks and send automatic alerts. Centering on key elements including police alerts, involved personnel, cases, physical evidence, working venues and case files, Zhifu Branch of Yantai Public Security Bureau strengthens inspection work through video-surveillance control rooms. Wujiang Public Security Sub-bureau assigns eight full-time supervisory police officers together with 20 auxiliary police staff. They carry out multi-dimensional, full-process supervision for overall law-enforcement activities. Third, fragmented supervision is replaced by comprehensive full-coverage governance. The Tianjin practice realizes end-to-end supervision covering every link, workflow, key factor and work scenario of public security law-enforcement. According to Li Mingxia, Director-General of the Legal Affairs Corps of Tianjin Public Security Bureau: “We have formed a positive cycle covering full-volume supervision, quality analysis-evaluation and dynamic law-enforcement optimization, which makes continuous upgrading of law-enforcement supervision possible.” Jiaozhou Public Security Bureau puts forward an innovative “1+3+2” framework for law-enforcement supervision and social governance improvement. Based on the law-enforcement case-handling management center, it builds an internal closed-loop system for “full-case clearance, all-officer training and whole-process supervision”. Meanwhile, it expands external functions to support police-alert analysis and cross-department joint case-handling.

3.2 Digital Restructuring of Collaborative Operational Mechanisms

Digital technologies break down information barriers between different police departments and different administrative levels, and reshape the logic of joint synthetic operations. Wang & Ma analyze the connotation of a broad supervision framework from political, rule-of-law and technological perspectives. Drawing on intelligent, collaborative and intensive practical experience from Beijing’s law-enforcement case-handling management centers, they propose an improvement path covering mindset renewal, resource integration, institutional reconstruction, digital empowerment and capacity building^[3].

On one hand, law-enforcement case-handling management centers serve as data convergence nodes. Police officers working on-site can obtain high-level access to various public security information resources. Dongchangfu Branch of Liaocheng Public Security Bureau moves research-and-judgment functions to the center. Case-handling staff can conduct in-depth data

analysis on suspects without leaving the center premises. Chengdu Hi-tech Zone Public Security Sub-bureau builds a big-data basic platform. It brings different investigation tools and resources together inside the center, removing data silos and operational bottlenecks. Professional teams from different police divisions of Changchun Public Security Bureau adopt an on-site resident “front-shop-back-factory” working mode. They open dedicated data channels connecting municipal big-data platforms with the center. On the other hand, a new synthetic-operation mode has taken shape: one work request can trigger comprehensive institutional support. Investigators from Yongkang Public Security Bureau can submit online work orders according to actual investigation needs. The center gives rapid feedback, mobilizes corresponding police forces, and realizes simultaneous review, work guidance and approval procedures. The Law-enforcement Case-handling Management Center of Tianjin Public Security Bureau sets up consultation mechanisms at municipal and district levels for case-jurisdiction transfer. On average, jurisdictional disputes can be settled within 1.5 hours. Public security organs in Beijing take the lead in building synthetic-operation mechanisms within law-enforcement case-handling management centers. They put forward cross-department and cross-platform working rules: staff can apply for full-network data query in advance, and special demands will get timely responses.

3.3 Intensive Upgrading of Service-guarantee Mechanisms

Digital empowerment changes service guarantee work. It turns many originally outsourced administrative routines into technology-backed intelligent support services.

In terms of workflow optimization, end-to-end informatization reform carried out by Chengdu Hi-tech Zone Public Security Sub-bureau shortens the whole case-handling cycle from more than 15 hours down to a minimum of 3 hours. To separate administrative trivial work from core investigation work, specialized staff within centers take charge of auxiliary procedures right after suspects are admitted: identity verification, physical examination, biometric information collection, suspect custody and centralized escort. In Changchun Public Security Bureau, administrative burdens for investigators are cut by over 70 %, and average case-handling time drops by five hours. Dongchangfu Branch of Liaocheng Public Security Bureau takes the lead in setting up special suspect-escort teams selected from special-police units. The team follows standardized rules with fixed personnel, vehicles, responsibilities and work posts. Yongkang Public Security Bureau establishes professional escort teams, which provide one-stop services including inspection, property safekeeping, document delivery, suspect custody, catering, physical examination and suspect transfer. For cross-agency cooperation, digital political-legal coordination platforms support full-process online circulation of criminal case files. Yongkang Public Security Bureau independently develops a “detention direct-pass” application platform. It makes online information exchange of detainee data, case materials and physical-evidence information more efficient. For police-medical cooperation, Dongchangfu Branch of Liaocheng Public Security Bureau pilots a socialized physical-examination model. Through public bidding and formal contracts, cooperating hospitals invest in and assign medical staff to on-site examination facilities provided by public security organs. In this way, pre-detention physical examination time is reduced from two hours to 30 minutes.

4. Deep-seated Challenges for Digital Empowerment

Even though practical achievements are notable, multiple deep-rooted obstacles hold back the expected performance of digital empowerment.

First, technical equipment often shows limited practical adaptability. Some law-enforcement case-handling management centers have not updated their working ideas to fit new-era

police-service requirements. Hardware and system configuration sometimes fail to match real-world front-line needs, so many intelligent devices are not used to their full potential.

Second, data barriers have not been completely removed. Cross-department data sharing between different political-legal bodies still remains insufficient. Though a small number of regions have realized docking with political-legal coordination digital platforms, information interoperability between public security organs and procuratorate, court, judicial-administrative organs still faces widespread difficulties.

Third, the phenomena of “built yet rarely used” or “insufficient application” are quite common. Influenced by long-established organizational habits, some facilities and functional modules cannot produce expected benefits. Simply introducing new technical systems cannot automatically change original work patterns. Conflicts exist between traditional case-handling customs and newly-built innovative operation modes. Zhuang and Li point out that further reforms guided by trial-centered litigation are necessary to improve supervision quality^[2].

Fourth, supervision precision still needs improvement. Provincial-level departments cannot obtain real-time case-handling information from all subordinate regions, which makes overall jurisdiction-wide precise governance difficult. Intelligent supervision models need further improvement in coverage scope, early-warning accuracy and closed-loop handling rate. Empirical research conducted by Cai and Yang shows that imperfect law-enforcement accountability rules, overlapping functions between investigation and supervision roles, plus insufficient awareness and professional capacity for physical-evidence and dossier supervision, continue to weaken supervision effectiveness^[4].

Fifth, digital governance thinking falls behind technical progress. Some work units attach too much importance to technical tools while ignoring management system optimization, which leads to low-level utilization of data resources. Digital empowerment is far more than a pure technical matter; it also requires transformation of governance ideas and organizational culture. Based on Xi Jinping Thought on the Rule of Law, relevant scholars propose integrated development directions for case-handling centers. They advocate shifting from fragmented extensive governance toward centralized refined governance, and shifting from post-incident disposal toward early-stage risk governance.

5. Collaborative Pathways for Digital Empowerment and Mechanism Innovation

5.1 Deep Coupling between Technological Application and Institutional Design

Better performance brought by digital empowerment comes from joint evolution between technology and institutions. Intelligent reform should not be understood as merely adding technical tools. Authorities must push forward workflow reconstruction, re-division of power and responsibility, and update relevant rules at the same time. Jiaozhou Public Security Bureau’s practical experience shows that law-enforcement case-handling management centers are not just places combining different functional spaces. Through function aggregation, resource convergence and digital-intelligent empowerment, they reshape the whole law-enforcement operation mode. Guided by Xi Jinping Thought on the Rule of Law, scholars have put forward integrated development directions for these centers. This paper suggests building a two-way adaptive mechanism: technical demands feed back to institutional adjustment, and technical deployment is oriented toward real-world work scenarios. In this way, technical innovation and institutional reform can move forward side by side. Zhifu Branch of Yantai Public Security Bureau explores an integrated mode combining case review, daily administration and service provision. Case-review police officers take part in full-process monitoring and review work, so as to strengthen case judgment, specialized administration and supporting services. Wang and Liu emphasize the value of

studying real-world operating conditions, to help these centers move from “construction completion” to “effective practical operation”^[1].

5.2 Systematic Construction of Data-sharing and Collaborative Mechanisms

Removing data barriers serves as a basic prerequisite for digital empowerment. Authorities need to speed up interconnection among political-legal department platforms, and unify data standards and interface specifications. Meanwhile, we should further improve the new police operation mode of “specialized expertise plus institutional mechanisms plus big data”, and build cross-agency, cross-level mechanisms for data sharing and joint case-handling. The practice of Fuyang Branch of Hangzhou Public Security Bureau is worth promoting. It relies on political-legal coordination digital platforms to break inter-department barriers and realize online circulation of criminal case files. Yongkang Public Security Bureau sets up special investigation-supervision and coordination offices. Procuratorial staff come to work on-site every week. They hold joint discussions on major and controversial cases together with criminal-investigation and legal-affair divisions. Wang & Ma put forward a systematic optimization framework covering “mindset renewal, resource integration, institutional reconstruction, technological empowerment and capacity building”, which offers useful guidance for constructing data-sharing and collaborative systems^[3].

5.3 Organic Integration of Artificial-intelligence-enabled Supervision and Human-led Oversight

Intelligent supervision cannot completely replace human professional judgment. We should set up a dual-review mechanism: intelligent preliminary screening paired with in-depth manual analysis. Intelligent models take charge of real-time perception and automatic early warning, while reserving room for police officers to exercise professional discretion when facing complex situations. The law-enforcement supervision platform of Jiaozhou Public Security Bureau extracts case data every day. It generates electronic case files by adopting “intelligent preliminary screening plus in-depth human analysis”, which provides valuable practical reference. Drawing on outputs from various management systems, Zhifu Branch of Yantai Public Security Bureau carries out real-time intelligent analysis for personnel access records, on-site conditions and risk alerts, and realizes intelligent dossier management. The positive cycle of “full-volume supervision, quality analysis-evaluation and dynamic law-enforcement optimization” developed by Tianjin Public Security Bureau provides an institutional framework for combining intelligent supervision and human oversight. Cai & Yang suggest optimizing law-enforcement accountability mechanisms, promoting unified municipal-level governance, and strengthening supervision over physical evidence and dossiers, so as to raise overall supervision performance^[4].

5.4 Synchronized Improvement of Digital Competencies and Rule-of-Law Literacy

Digital empowerment ultimately depends on the capacity of police personnel. Training work should improve police officers’ digital operation ability as well as their rule-of-law awareness. Authorities need to build a closed-loop training system: identify practical problems, organize targeted training, and track work-performance improvement. Law-enforcement case-handling management centers can act as practical-training bases, hosting regular legal-practice workshops and rotational on-site training courses^[5]. Yongkang Public Security Bureau builds the Wufeng Police Academy practical-training base inside its center. It sets up practical teaching modules for interrogation, intelligence analysis and case-handling work, and develops innovative “theory-plus-practice” integrated law-enforcement training. With its “full-case clearance, all-officer

training and whole-process supervision” mechanism, Jiaozhou Public Security Bureau helps all police staff improve both practical law-enforcement capabilities and rule-of-law awareness at the same time.

6. Conclusion

Under the trend of intelligent reform, digital empowerment within law-enforcement case-handling management centers brings far-reaching transformation: work focus shifts from simple technical superposition toward institutional reshaping. This transformation is more than hardware upgrading. It involves systematic reconstruction of law-enforcement power operation modes, supervision patterns and organizational culture. Local practical experience proves that digital empowerment can produce real-world gains: it improves case-handling efficiency, strengthens law-enforcement supervision, and optimizes supporting service guarantees. Even so, multiple deep-rooted restricting factors still exist, including poor practical adaptability of technical tools, data silos and outdated governance ideas. In future work, relevant departments should promote deep matching between technical application and institutional design, build complete data-sharing and collaborative mechanisms, realize effective combination between intelligent supervision and human professional oversight, and simultaneously raise police officers’ digital skills and rule-of-law awareness. These measures will help realize the transition from physical-space integration toward better institutional effectiveness, and provide lasting driving force for law-based public security governance.

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