

# A Research Report on the Implementation of Smart Correction Practices in Chengdu

## --A Case Study of Longquanyi and Qingbaijiang Districts

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### Abstract

In recent years, the Ministry of Justice has issued several implementation opinions and notices to accelerate the development of smart correction, and has launched the creation of smart correction centers across the country. Chengdu City has been actively responding to this initiative by promoting the deep integration of modern technologies such as big data and artificial intelligence with community correction work. The project team conducted research in the representative judicial bureaus of Qingbaijiang District and Longquanyi District in Chengdu City and found that, despite the progress made in the construction of smart correction, there are still several issues that need to be addressed. These include the underutilization of emerging technologies, inadequate defense in the field of information security, and a lack of resource guarantee for overall construction. To address these issues, the project team proposes several recommendations based on theoretical research and empirical investigation. These include broadening the application field of emerging technologies, promoting the research and development of core applications of smart correction, strengthening data security protection and resource guarantee, and empowering the overall construction of smart correction. By implementing these recommendations, the project team hopes to provide valuable guidance and references for the future development and improvement of smart correction..

### Keywords

Community correction, Intelligent correction, Empirical research, Big date, Artificial intelligence.

## 1. Background and Significance of the Research

### 1.1. Research Context

The community correction system has been instrumental in fostering social harmony, stability, and the development of a law-based society. The progress of the time will facilitate the reform. As technological advancements such as artificial intelligence, blockchain, and big data analysis emerge, smart correction has evolved as a crucial development trajectory for community correction initiatives. In 2017, the 19th National Congress of the Communist Party of China explicitly outlined the strategic plan for constructing a "Internet power, digital China, and smart society." Subsequently, in 2019, General Secretary Xi Jinping emphasized, during the Central Political and Legal Work Conference, the necessity of encouraging the profound integration of innovative technologies, such as big data and artificial intelligence, with judicial operations. This guidance illuminated the path for assimilating community correction work with new technologies. In pursuit of smart correction approaches aligned with China's reality, community correction institutions nationwide have proactively advanced the development of "smart correction" based on the Ministry of Justice's "Implementation Opinions on Accelerating the

Construction of National ‘Smart Correction’” and “Notice on Carrying out the Construction of ‘Smart Correction Centers’”, continually fortifying the “one platform, two centers, three support systems, and four smart integrations” system construction.

## **1.2. The Significance of Promoting the Construction of Smart Correction in the Context of New Technologies**

Establishing smart correction centers is an important way to promote innovative development in community correction, an important measure to improve law enforcement quality, regulatory efficiency, and criminal enforcement, and maintain social harmony and stability. Community correction implementation features complexities in the work objects, comprehensive content, widespread regions, and uncontrolled administration. Leveraging the advantages of emerging information technologies can meet the practical needs of community correction work and drive its efficient and fast operation. However, China’s judicial administrative organs developed late, with a relatively weak foundation in informatization construction[1]. Under the current circumstances where traditional community correction work models have low efficiency and insufficient results, exploring the brand-new management model of “smart correction” plays a significant role in profoundly transforming China’s original management model of judicial and administrative work and achieving the transformation and upgrading of informatization construction in China’s judicial and administrative management organs[2]. Furthermore, the current implementation of community correction smart supervision and education practices remains confined to select regions, with a scarcity of universally applicable experiences. Investigating the construction experiences of pilot areas can furnish new developmental concepts and directions for comprehensively promoting the smart correction work construction.

## **2. The Advancement of “Smart Correction” in Chengdu**

Complying with the Ministry of Justice’s deployment stipulations concerning the “digital rule of law and smart justice,” Chengdu has swiftly enacted various measures, actively orchestrating and implementing innovative projects. By integrating contemporary information technologies, such as the Internet, cloud computing, the Internet of Things, big data, artificial intelligence, and blockchain, with community correction work, Chengdu emphasizes the digital, interconnected, and smart evolution of community correction initiatives. The city aspires to devise a working model characterized by data consolidation, smart management, mobile interconnectivity, and visual command. In doing so, it renovates and modernizes community correction centers, intensifies smart applications, bolsters management and educational efficacy, refines facilities and equipment, and propels the standardization, sophistication, and intelligence of community correction work.

Currently, the Qingbaijiang District in Chengdu has established the city’s most sophisticated smart community correction center, garnering significant acclaim from both the Provincial Department of Justice and the Municipal Bureau of Justice. As a pilot district for the implementation of smart correction centers in Chengdu, the Longquanyi District has meticulously adhered to the Ministry of Justice’s “General Technical Specifications for Smart Correction,” ensuring rigorous standardization in construction, procedural conformity, and the integration of advanced information technology. Consequently, the center has been granted approval upon rigorous remote evaluation by the Ministry of Justice, thereby exemplifying the quality of a superior graduate thesis.

## **2.1. The Current State of Smart Correctional Infrastructure in Qingbaijiang District**

### **2.1.1. Constructing Standardized Facilities for a Stronger Foundation for Smart Correction**

The Qingbaijiang District Smart Correctional Center boasts a full suite of functional rooms and office systems, including a library, announcement room, information collection room, voiceprint collection room, self-correction room, remote visitation room, social liaison room, command center, venting room, admonition room, psychological counseling room, skills training room, and educational training room. The library, or "House of Law," amalgamates educational and legal functions, providing a comprehensive legal education program for the district's social correctional subjects. The information collection room and voiceprint collection room facilitate the acquisition and comparative analysis of information on social correctional personnel. Voiceprint data allows for the identification of individuals, the prompt confirmation of the status of social correctional personnel, and comprehensive recording of the entire process via telephone, facilitating record-keeping and supervision of the social correction process.

### **2.1.2. Leveraging the "Xinwo" App for Data-Driven Analysis and Judgement**

In addition to employing the province-wide unified platform for smart community correction, Qingbaijiang District has invested in the "Xinwo" app for educational support. The "Xinwo" app has secured deep collaboration with Huawei and presents itself as a superior solution due to its advanced security and intelligence features. The app utilizes technology that separates applications and data, possessing a comprehensive user permission grading management system and log recording system, thereby mitigating the risk of malicious attacks and ensuring optimal security and confidentiality. The Xinwo app's smart tutorial system executes personalized correctional education, allowing for the integration and analysis of each student's basic information and enrollment assessment, sentence period, employment capabilities, family situation, and psychological condition, and providing personalized educational courses to the students, culminating in data-driven learning reports.

### **2.1.3. Implementation of an Electronic File Management System**

The district has procured almost a hundred pieces of information equipment and implemented a unified configuration, employing the government's external network to link all points. The cloud system data localization configuration has been fortified, and a standardized data input protocol has been enforced, ensuring that all files are uploaded 100% to the platform, enabling law enforcement information analysis and judgement, evidence preservation, procedure circulation, document generation, result inquiry, quality assessment, and full supervision to be conducted online.

## **2.2. Current Status of Smart Correction Construction in Longquanyi District**

### **2.2.1. Relying on Intelligent Platform to Implement Network Office Operations**

The Sichuan Province-level Integrated Community Correction Platform provides online services for various stages of community correction, including investigation and assessment, correction delivery, correction removal, and statistical queries. Longquanyi District Judicial Bureau has achieved certain results in carrying out smart correction work by relying on the province-level integrated community correction platform. Firstly, under the coordination of the provincial community correction platform, daily management is now smart. On one hand, through self-service correction terminals, community correction targets can complete identity verification and information collection autonomously in scenarios such as reception registration, daily reporting, individual education, and group education. For instance, individuals under correction can enter basic identity information, facial information,

fingerprint information, and voiceprint information by swiping their ID cards on the self-service correction terminal, and then complete the correction procedures by selecting the judicial office based on their residence. In addition, they can apply for leave, change of execution location, participate in remote education, remote assistance, public welfare activities, and legal publicity through the self-service correction terminal. On the other hand, the "In-Correction App" is used as the mobile version of the "Self-Service Correction Terminal" to facilitate the supervision and management of individuals under correction. Secondly, the provincial community correction platform has bridged the information gap within the judicial administration, connecting the People's Court, People's Procuratorate, and public security system to share and exchange information, supporting the exchange of data in the form of electronic files for relevant legal documents, and greatly improving the efficiency of staff.

### **2.2.2. Establishing a Community Correction Information Command Center**

The Command Center is equipped with a display screen that matches the area of the Community Correction Command Center, which should have the ability to access computer signals, audio-video conference signals, and video surveillance signals. It also has audio-video conferencing capabilities, supporting point-to-point and one-to-many audio-video conferencing facilities for community correction command and dispatch based on the judicial administration system network.

### **2.2.3. Utilizing New Technology for Visual Supervision and Administration**

By adopting location and geographic information technologies such as Beidou, GPS, Wi-Fi, base stations, and video surveillance recognition, the system supports dynamic tracking and real-time monitoring of community correction subjects, with intelligent analysis capabilities. It can detect anomalies in community correction subjects and proactively issue warnings. It has the ability to assess the confidence level of location data, discern the quality of location data for community correction subjects, ensure the authenticity and reliability of location data, and has the ability to identify and determine the separation of people and electronic positioning devices in community correction, ensuring the timely and effective location data of community correction subjects.

## **3. Problems**

### **3.1. Insufficient Utilization of Big Data and Blockchain Technology**

Firstly, there is a significant gap in comprehensive data collection. At present, the personnel mainly collect static information, such as the identity and social relations of the correctional object. However, the collection of dynamic information, such as the physiological, psychological, behavioral, cognitive, and emotional aspects of the correctional object, is inadequate in both coverage and depth, failing to achieve full-cycle correctional coverage.

Secondly, the degree of data connectivity and business collaboration is relatively low, and the content of data sharing is limited. Although community correction agencies have established a certain degree of data sharing and business flow with other judicial authorities, they are yet to accomplish complete data sharing of community correction and full-process business collaboration. Specifically, the vertical system has not been connected to departments such as prisons and drug rehabilitation, while the horizontal connection with courts, procuratorates, public security, civil affairs, and social security community correction-related business data and process data cannot be automatically collected. The connectivity degree is low, and the problem of "isolated information" still exists[3]. Notably, there is a significant shortcoming in the technical information connection with public security. For instance, public security technical information, such as traffic trajectory queries and checkpoint photos, has yet to be shared. Moreover, the community correction center can only obtain real-time monitoring videos of the

correctional object, whereas only public security can play them back. Furthermore, the interconnection of community correction-related information with provincial and municipal political and legal departments in other provinces and cities has not been achieved, hindering remote correction through the internet. Given the frequent mobility of the national population and the rising number of cases of non-custodial sentences where the judgment place and execution place belong to different provinces, cross-provincial correctional cases are increasing. Consequently, the mobility of community correction objects is high, requiring more cross-provincial entrusted management. In this context, local staff can only acquire knowledge of the daily performance of the correctional object through paper-based means, since the information systems are inconsistent, impeding a deeper understanding of the correctional object and effective assistance[4].

### **3.2. Insufficient Development of Artificial Intelligence Technology**

The “General Technical Specification for Smart Correction” of the Ministry of Justice outlines the need for big data applications to implement location data analysis, psychological data analysis, education assistance analysis, and community correction plus blockchain application. However, compared to the advanced experiences in other provinces and cities, the intelligence level in Chengdu remains relatively low. Personalized customized management plans for correctional personnel have yet to be realized, while the application of computer networks remains basic. In addition, software development for smart analysis, smart evaluation, and smart program design for community correction personnel lags behind, and has not been substantially launched. Consequently, the integration of smart applications is far from sufficient. For example, psychological evaluation relies solely on the SCL90 scale, which provides relatively limited data and fails to fully reflect the psychological status of community correction personnel. The inadequacy of these functions significantly impairs the level of intelligence in community correction.

### **3.3. Deficiencies in Network Information Security and Control Capabilities**

At present, extant community correctional facilities are overlooking the crucial aspect of data security protection during the employment of electronic data, leading to systemic issues including decentralized system deployment, insufficient allocation of resources to network and information security, inadequate emphasis on the matter, and feeble defensive capabilities. There exists a pressing necessity to augment network security awareness, mechanisms, and proficiencies.

### **3.4. Suboptimal Holistic Support for the Implementation of Intelligent Corrections**

Although the city of Chengdu has devoted considerable human and material resources toward advancing intelligent corrections, the current efforts fall short of fully establishing an integrated intelligent corrections platform. On one hand, there is a palpable dearth of professional human resources. The quantity and quality of community corrections personnel necessitate significant enhancement. Firstly, with respect to ideological comprehension, certain grassroots employees fail to grasp the critical importance of intelligent corrections infrastructure, resulting in diminished work proactivity. Some staff members remain entrenched in conventional work methodologies, initially performing tasks offline before transitioning to online operations, inadvertently increasing their workload. Secondly, in terms of specialized talent, a number of district-level judicial administrative bodies lack the requisite professional and technical expertise, demonstrating an insufficient understanding of the norms and standards governing intelligent corrections development. Grassroots community corrections personnel exhibit challenges such as delayed knowledge acquisition, subpar network maintenance abilities, and unfamiliarity with the operation of automated correction terminals and related equipment. The

scarcity of individuals possessing both community corrections and information technology expertise is even more pronounced. The ineptitude of grassroots community corrections teams in employing new technologies culminates in the underutilization of the technical advantages provided by intelligent corrections.

On the other hand, there is an absence of efficacious material support. Owing to the economic development discrepancies among districts, budgetary constraints render the procurement of sophisticated law enforcement equipment and apparatus challenging. For instance, several community corrections agencies in eastern regions employ electronic bracelets that, once fastened, cannot be removed by the wearer, conferring benefits such as heightened supervision precision and reduced potential for evading oversight when compared to traditional mobile phone base station positioning. Nevertheless, Chengdu's community corrections agencies, constrained by limited funding, have yet to adopt this innovation on a widespread scale, continuing to rely on conventional mobile phone base station signal positioning. This approach can precipitate personnel positioning inaccuracies when confronted with signal instability. Insufficient funding and equipment availability impede the effective execution of smart corrections construction.

## **4. Successful Experience and Suggestions for Improving the Construction of Smart Correction in Chengdu**

### **4.1. Successful Experience**

The establishment of "Smart Correction Centers" has become a crucial means to promote the transformation and upgrade of community correction centers and to advance the leapfrog development of community correction work. The establishment of such centers has been implemented in Sichuan Province following the guiding principle of "comprehensive promotion, staged inspection," with the goal of achieving the establishment of "Smart Correction Centers" in all cities and prefectures by 2025. Longquanyi and Qingbaijiang districts have spearheaded the intelligent construction of community correction centers, leveraging novel technologies such as big data, artificial intelligence, and virtual reality to drive the standardization and efficiency of community correction work and to comprehensively enhance the application of information technology in community correction work. This model of informationization construction can serve as an exemplary blueprint for the judicial administrative system and can set the tone for others who will soon undertake similar work in other regions of Chengdu.

### **4.2. Suggestions for Enhancement**

#### **4.2.1. Expanding the Application of Big Data and Blockchain**

To address the challenge of incomplete data collection, wearable devices (e.g., smart bracelets), mobile data collection devices (e.g., GPS real-time positioning data), and mobile device video data can be widely applied for online data collection. In particular, correctional subjects should be required to wear wearable devices to collect their movement trajectory, action mode, pulse, blood pressure, and other data. This data should be uploaded continuously to a mobile app every 24 hours, and the app's crime prediction and analysis function can predict the possibility of recidivism. If there are any abnormal situations, warnings will be sent to the working personnel's end. To overcome the "isolated information" problem within the judicial administrative system, forward-looking smart community correction systems can be constructed based on blockchain technology. Specifically, this can be achieved on three levels: first, the interconnectedness within the community correction system, where different regions and levels of correctional institutions can be integrated through a smart platform; second, data linkage between the community correction system and other political and legal departments; and third, information exchange between the community correction system and other social

service agencies. Ultimately, this will culminate in a joint system of community correction chains, political and legal alliance chains, and full-factor linkage chains. "Blockchain Plus Community Correction" can not only deal with the "isolated information" phenomenon in community correction but also transform traditional management methods, promote other areas of social governance to follow suit, force the entire social governance system to change its working thinking and governance mode, and construct an innovative vision for the new era of social governance[5].

#### **4.2.2. Problem-Oriented Approach and Focus on Core Application Development of Smart Community Correction**

In recent years, speech recognition technology has matured considerably and has been adopted by public security, procuratorate, and court departments in their judicial practices. By utilizing speech recognition technology, audio information can be intelligently recognized, providing a tool for judicial personnel to quickly input text. Currently, the speech recognition function of the self-service correction terminal in Chengdu's community correction institutions is not perfect. Therefore, relevant technology development companies can be commissioned to further upgrade the speech recognition system, improve the software's network and service system, and cater to the working habits of correctional workers. Additionally, the technology for facial recognition, physiological feature recognition, psychological feature recognition, etc., should be further optimized, such as adopting more advanced dynamic psychological state assessment mechanisms. For example, daily mood check-ins, writing mood diaries, creating mood portraits, optimizing psychological detection systems, real-time analysis and scoring of user data, setting psychological assessment red lines, and timely warning can provide technical support for law enforcement personnel to improve efficiency, scientific evidence collection, and standardized law enforcement.

In the realm of software design, the establishment of a correction case bank can pave the way for the construction of a correction policy recommendation algorithm model based on deep reinforcement learning. This would effectively optimize the intelligent recommendation algorithms for correction plans using big data. Correction workers can efficiently input and classify personal basic information, crime facts, repentance performance, and psychological conditions of correctional targets into the crime prevention platform. Additionally, they can process the characteristic data of community correctional targets. By leveraging intelligent analysis and judgment, in conjunction with practical experience and legal basis, personalized correction plans can be formulated, ultimately achieving the ideal of "one person, one plan" and realizing precise supervision and correction.

#### **4.2.3. Strengthening Data Information Security Protection**

In accordance with the provisions of Cybersecurity Law and the national information security level protection requirements, a key information infrastructure security plan in the community correction field should be compiled and put in place to guide and supervise the operation and security protection of key information infrastructure. Strict management of network and business systems should be implemented to ensure the safety and controllability of data collection, storage, and transmission, thereby ensuring the security of the "smart correction" informationization system. Additionally, specialized security management organizations and security management personnel should be established to conduct regular network security education, technical training, and corresponding skills assessments for practitioners. Emergency plans should be formulated, regular drills should be conducted, and important systems and databases should be backed up for disaster recovery[6].

#### 4.2.4. Providing Effective Material and Talent Support to Ensure the Quality of “Smart Correction”

The construction funds of the “smart correction center” should be included in the local government's financial budget, with “smart correction” being incorporated into local information construction projects, implementing special funds and operation and maintenance fees for “smart correction” construction. Throughout this process, full-process supervision should be implemented, with on-site problem discovery and face-to-face solutions to guarantee the efficiency, stability, and standardization of the “smart correction center's” construction and its extensive use.

Additionally, it is crucial to strengthen professional talent training and optimize the professional quality of the workforce. Professional and technical personnel should be introduced, with composite talents having both legal knowledge and new technology knowledge being reserved to promote the overall professional quality of the community correction team. Training should be reinforced, with community correction workers regularly scheduled to learn relevant smart correction courses to improve their business capabilities using modern technology. This would improve the efficiency of the integrated platform and enable intelligent technology to be effectively utilized for community correction. Assessment should also be strengthened to cultivate the information application awareness of community correction social workers continuously. Practical training and inspection supervision should be reinforced for information application, with information application ability included in the annual assessment. The management channels of information construction should be standardized, continuously improving the information application ability of community correction workers and social workers, thereby enabling informationization to become an essential lever for promoting community correction work[7].

Regarding the problem of insufficient personnel, the integrated service system can be improved, and some activities of community correction workers can be outsourced on the platform to reduce their workload. For example, volunteer service organizations and other social organizations can be opened on the platform for public welfare activities. After verifying related qualifications, bidding can be conducted, and the community correction center can release activity plans and requirements.

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