



Research on the Digital Patrol and Prevention System Under the Perspective of Peaceful China

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Abstract

This paper delves into the development of a digital patrol and prevention system against the backdrop of the Peaceful China initiative, aiming to address the intricate challenges posed by social security. Through methods such as literature analysis and detailed case studies, along with an examination of the "Longcheng Safe e-Patrol" initiative in Changzhou, the study outlines strategies and pathways for constructing a comprehensive, intelligent, and three-dimensional digital patrol and prevention system. The research uncovers that such a system can drastically bolster the efficiency of social security prevention and control efforts, facilitating seamless collaboration and swift responses. This study not only presents a foundational theoretical framework but also offers a tangible, real-world example to enhance China's social security prevention and control capabilities. Future endeavors should focus on reinforcing technological advancements and information infrastructure, refining the deployment and cooperation frameworks of patrol teams, and augmenting legal and policy frameworks to dynamically adapt to evolving social security landscapes.

Keywords

Peaceful China; digital patrol and prevention system; Longcheng Safe e-Patrol

1. Introduction

With the high-quality development and widespread application of new-generation information technologies such as artificial intelligence, big data, Internet of Things, cloud computing, and blockchain, profound changes are occurring in people's lifestyles, and the social security landscape is becoming increasingly complex and volatile [1-3]. Issues such as information asymmetry, uneven resource allocation, and slow response speeds have severely constrained the effectiveness of patrol and prevention work. Under the Peaceful China strategy, the modern large-scale patrol and prevention system urgently requires digital reform to enhance governance efficiency. The "Longcheng Safe e-Patrol" project in Changzhou, as a successful case of digital patrol and prevention, significantly improved police management and social security prevention and control capabilities by efficiently integrating resources and accelerating response speeds. This study focuses on this project, using literature review, case studies, field research, and other methods to systematically analyze the implementation pathways, effectiveness assessment, challenges, and solutions of digital patrol and prevention in the construction of a modern large-scale patrol and prevention system.

2. Theoretical Basis of the Digital Patrol and Prevention System

2.1 The Connotation and Goals of Peaceful China Construction

The report of the 20th National Congress of the Communist Party of China has identified "advancing Peaceful China construction solidly" as a critical content of the main objectives and tasks [4]. Under the new situation, solidly advancing Peaceful China construction is a significant strategic task for firmly safeguarding national security and social stability on

the new journey. Maintaining national security and building a higher-level Peaceful China is a strategic move to create a new realm of "governance with Chinese characteristics" [5]. The Peaceful China strategy, as a grand blueprint for national development, profoundly encompasses multi-dimensional security systems such as people's security, political security, and economic security, aiming to construct a comprehensive and multi-layered security shield. Its core lies in firstly, putting people first, considering people's security as the fundamental purpose to ensure the maximization of people's interests; secondly, leading with the rule of law, comprehensively advancing the rule of law, and providing a solid legal guarantee for Peaceful China construction; thirdly, innovating social governance, enhancing the ability to address complex social issues through strengthening and innovating social governance; and fourthly, strengthening public safety, constructing an efficient risk prevention and control system to effectively respond to various challenges.

The goals of Peaceful China are clear and ambitious, fundamentally aimed at achieving long-term stability for the country and prosperity for the people. Specifically, it aims to build a social environment of political stability, economic prosperity, social harmony, technological advancement, cultural flourishing, and ecological beauty, allowing people to enjoy a happy life in a peaceful and tranquil society. The realization of this goal requires the concerted efforts and promotion of the entire society, including governments, enterprises, social organizations, and individuals. The Peaceful China strategy is not only an essential national development strategy but also a common pursuit of all people. By implementing measures such as strengthening the national security system, deepening Safe City initiatives, strengthening comprehensive social security management, enhancing public safety risk prevention and control, and strengthening legal publicity and education, we can gradually build a safe, stable, harmonious, and beautiful social environment, enabling people to share the fruits of development in the construction of Peaceful China.

2.2 The Current Situation and Challenges of Traditional Patrol and Prevention Models

As a complex and comprehensive policing activity, patrol prevention and control should pursue an efficient model featuring information-guided patrols, capable command, multi-police collaboration, rapid response, and proactive strikes in the context of informatization [6, 7]. However, the current construction of patrol prevention systems faces numerous challenges and limitations in contemporary social security management. Firstly, traditional patrol prevention relies heavily on simple patrols by manpower and vehicles, lacking the support of informatization and intelligence, resulting in low patrol efficiency and difficulties in accurately and effectively preventing and controlling crimes. Patrol police often have to rely on experience and intuition, lacking scientific data analysis and prediction, making patrol prevention work appear blind and passive. Secondly, the police resources in the traditional patrol prevention model fail to achieve effective collaboration and sharing. Patrol forces often work in isolation, lacking effective coordination and support, making it difficult to form a tight patrol network. There is inadequate communication and information sharing among various levels of patrol prevention forces, and work lacks cohesion, making it difficult to effectively share dynamic police information [6]. Thirdly, with the acceleration of urbanization and the complexity of social security situations, traditional patrol prevention models struggle to cope with new types of crimes and emergencies. Emerging crime methods are constantly emerging, and criminal activities are becoming increasingly concealed and intelligent, while traditional patrol prevention models have obvious deficiencies in intelligence gathering, analysis and research, and rapid response [8].

2.3 Overview and Characteristics of Digital Patrol and Prevention System

The digital smart policing patrol and prevention system leverages mobile intelligent terminals, big data, cloud computing, artificial intelligence, and other technologies to facilitate police officers in information collection, verification, and public security patrols, enabling rapid response to incidents and the collection of basic social information. Additionally, the analytical tools provided by artificial intelligence and big data play a crucial role in supporting patrols, major security events, school guard duties, and decision-making, genuinely reducing the workload and enhancing the efficiency of grassroots police officers. The digital patrol and prevention system is characterized by three main features: comprehensive coverage, rapid response, and efficient coordination. By scientifically planning patrol areas and routes, the digital system achieves all-round coverage of social areas, ensuring no blind spots in patrol work and significantly improving the effectiveness of social security prevention and control. Through the construction of an efficient command and dispatch system and an information-sharing platform, the digital system enables rapid response and disposal of various public security incidents. Once an incident occurs, the command center can quickly dispatch nearby patrol forces to the scene, effectively containing the situation. The digital patrol and prevention system emphasizes the coordination and cooperation among different patrol forces, establishing mechanisms for joint problem-solving, work linkage, and peace creation, thereby optimizing the allocation and efficient utilization of patrol resources.

3. Reform of the Digital Patrol and Prevention System

3.1 Background of the Digital Patrol and Prevention Reform

To effectively address prominent issues affecting social security and stability, innovate the three-dimensional social

security prevention and control system, and strictly prevent and punish various criminal activities in accordance with the law, the General Office of the CPC Central Committee and the General Office of the State Council issued the "Opinions on Strengthening the Construction of the Social Security Prevention and Control System" on April 13, 2015, clearly stating the need to "strengthen the construction of the social security prevention and control network, scientifically divide patrol areas based on factors such as population density, security situation, and geographical location, and optimize the layout of prevention and control forces." In July 2019, the General Office of the Ministry of Public Security issued the "Guidance on the Construction of the Social Security Prevention and Control System of National Public Security Organs," clearly stating the need to adhere to the principles of "grid-based policing, stationing police on the streets, preparing for duty while moving, graded response, flat command, fast response and high efficiency, intelligence-led, and technology-supported." Based on patrol area division, relying on the construction of street police stations, duty points, and duty teams, and supported by the "Smart Street Patrol and Prevention" project, it is necessary to integrate resources, improve mechanisms, innovate methods, achieve rapid response and efficient handling, and maximize the improvement of street control and deterrence. The digital reform is not only an inevitable trend in the transformation and upgrading of the modern large-scale patrol and prevention system but also a necessary requirement to cope with the complex and changing social security situation, which is of great significance for ensuring people's security and maintaining social stability.

3.2 Challenges in the Reform of the Digital Patrol and Prevention System

At the core of building the digital patrol and prevention system lie technological applications and information technology infrastructure. The integration and coordinated operations of patrol forces are crucial. On the technological front, while big data, AI, and IoT technologies can enhance efficiency, their rapid iteration requires continuous updates to the patrol system to address security environment challenges. Informationally, the conflict between information security and data sharing necessitates the construction of a secure network system that balances data sharing with security while simplifying data acquisition processes. Coordination-wise, public security agencies must break down barriers, establish information-sharing mechanisms, overcome information silos and resource fragmentation, and enhance unity and coordination. Simultaneously, coordination among diverse patrol entities poses difficulties due to organizational structure and differing responsibility definitions, resulting in hindered information sharing, uneven resource allocation, and impacting overall effectiveness. Rapid response and efficient disposition are also major challenges, hindered by issues such as delayed information transmission, uneven distribution of patrol forces, and varying equipment levels.

Furthermore, the reform faces issues such as the laggardness of laws and regulations, inadequate and uneven policy support, and the coordination between the two. Rapid technological advancements and evolving security situations often outpace the pace of legal developments, leaving gaps in data collection, usage, and protection regulations and lacking a clear legal basis for combating new types of crimes. Insufficient funding and resource support lead to weakened patrol forces and outdated equipment. Inconsistencies or conflicts between policies and regulations also hinder the efficiency and effectiveness of patrol work, such as the lack of legal support for the application of new technological means, creating legal vacuums and uncertainties in operations.

3.3 Countermeasures to the Problems in the Reform of the Digital Patrol and Prevention System

Confronting the complexities and challenges in the reform of the digital patrol and prevention system, comprehensive strategies must be implemented from multiple dimensions to drive development through innovation, ensuring the system's efficiency, security, and coordination. Firstly, by introducing high-tech equipment such as drones, night vision devices, and high-definition cameras, precision and efficiency in patrols are enhanced, reducing human workload. Data analysis technology enables rapid identification and early warning responses to abnormalities. Additionally, a unified information platform is established to break down departmental barriers, facilitating information sharing, resource integration, and coordinated actions for effective response to emergencies and ensuring social stability. To further optimize patrol force deployment, security needs are precisely assessed, resources are tilted towards key areas and times, and technological means are introduced to supplement human patrols, achieving flexible deployment. Scientific assessment and incentive mechanisms are established to motivate patrol personnel and cultivate a high-quality patrol team.

On the basis of strengthening technological innovation and optimizing patrol forces, the legal and regulatory framework and policy support system must be improved to provide a solid foundation for patrol work. Relevant laws and regulations are formulated and improved to clarify patrol responsibilities and authorities, safeguard patrol personnel rights, and establish oversight and punishment mechanisms to ensure patrol work is grounded in law and upholds the rule of law. Additionally, the government should clarify the legal status and responsibilities of social forces participating in patrols, establish a comprehensive information collection network, leverage big data to create dynamic early warning mechanisms, enhance police response speed and resource utilization efficiency, and inspire all sectors of society to collaborate in building a security defense line, jointly driving the continuous improvement of the patrol system.

3.4 Technical Support for the Reform of the Digital Patrol and Prevention System

In the deepening development of the digital patrol and prevention system, big data analysis provides a solid foundation for precise analysis, forecasting, and early warning. AI-assisted decision-making further propels the intelligence of patrol work, while IoT technology enables remote monitoring, and mobile internet technology facilitates convenient patrols. By collecting, integrating, and deeply analyzing massive amounts of data, patrol departments can gain insights into subtle changes in social security, enabling precise analysis, forecasting, and early warning, providing scientific decision-making basis for crime prevention and security. The integration of AI technology brings about an intelligent transformation in patrol work. From quickly locking onto criminal suspects through facial recognition to optimizing resource allocation and patrol routes through intelligent dispatch systems, AI's assisted decision-making significantly enhances patrol efficiency and accuracy [9]. It automates the processing of vast amounts of information, accurately identifies abnormalities, and adjusts strategies in real time, ensuring optimal resource allocation.

The convergence of IoT and mobile internet technologies constructs a comprehensive real-time monitoring and convenient communication network for the patrol system [10]. IoT technology, through video surveillance, sensors, and other devices, achieves remote monitoring and intelligent management of social security, providing real-time and precise information support for patrol personnel. The application of mobile internet technology frees patrol work from geographical constraints, enabling patrol personnel to receive, execute, and provide feedback on patrol tasks through mobile apps or mini-programs. Instant communication and information sharing through online platforms further enhance team collaboration and the overall effectiveness of patrol work.

4. Taking Changzhou's "Longcheng Safe e-Patrol" as an Example

4.1 Project Background and Objectives

As one of the first batches of Safe Cities in China, Changzhou, Jiangsu Province, has achieved remarkable results in the construction of its social security prevention and control system in recent years. In line with the national requirements for the construction of social security prevention and control systems, Changzhou has intensified efforts to promote the construction of a safe city in the new era, enhance the modernization of city-level social governance, strengthen the overall prevention and control of social security, and create a collaborative, co-governance, and shared social governance pattern. Starting in 2020, the Changzhou Municipal Public Security Bureau developed and continuously optimized the "Longcheng Safe e-Patrol" system.

Relying on the "Longcheng Safe e-Patrol" platform and the application of emerging technologies such as big data, IoT, and cloud computing, the Changzhou Municipal Public Security Bureau has digitized the "large-scale patrol and prevention" work, integrated the forces of dedicated police patrols, social patrols, and security volunteers, established a "safety chain," and achieved "information interconnection and work collaboration" between police forces and social forces. This has fostered a new smart governance model featuring "data-driven, human-machine collaboration, and cross-industry integration," enabling the transformation and upgrading of business digitization, shifting social governance from post-event emergency response to mid-event police-civilian collaboration and pre-event risk prevention.

4.2 System Architecture Design

The "Longcheng Safe e-Patrol" digital patrol management platform primarily focuses on three aspects: safety fulcrum system construction, safety force system construction, and application ecosystem construction. The safety fulcrum system revolves around "online dynamic networking and offline static gridding, with online and offline complementarity and integration," establishing offline public security fulcrums relying on police stations, traffic police booths, and security booths, and offline social safety fulcrums based on the gates of schools, hospitals, residential areas, financial institutions, enterprises and institutions, and large supermarkets along the streets. It also explores setting up online volunteer patrol safety fulcrums in areas with high crime rates, dense crowds, and active night economies.

The safety force system utilizes the "Longcheng Safe e-Patrol" mini-program as a carrier, establishing management modules for "dedicated patrols, social patrols, and volunteer patrols." Police officers, social patrol units, and security volunteers register under their respective modules, breaking the traditional top-down linear model and establishing a wide-ranging mesh model involving both police and social forces. This achieves "unified management, unified mapping, unified command, and unified broadcasting" of the city's large-scale patrol forces, reinforcing the foundation of safe Changzhou construction.

The application ecosystem construction further promotes the digital transformation of the safety fulcrum and force systems. Centering on these scenarios, it develops application modules to support information, fulcrums, and operations, empowering the digital management of the force and fulcrum systems. Combining the work content of various forces and fulcrums, it utilizes big data, IoT, cloud computing, and other technologies to build intelligent, application-driven business modules, fostering a digital application ecosystem that interconnects and collaborates information and operations among dedicated patrols, social patrols, and volunteer patrols.

4.3 Digital Patrol Empowering Practical Scenarios

Digital patrol empowers various practical scenarios, leveraging the "Longcheng Safe e-Patrol" mini-program to establish an efficient and collaborative safety protection system. Based on the real-name registration of the mini-program, this system establishes a safety "chain" between police operation units and social patrol units. After logging in, each unit automatically accesses the names and contact information of corresponding units in the patrol area, enabling one-click calling for "communication interconnection, task collaboration, police situation joint handling, and overall joint defense."

Combined with the safety broadcast module, the squad customizes and pushes early warning information, instructions, and broadcast content to different groups, including security personnel for large events, social patrol units, and volunteer patrols, for content such as severe weather warnings, missing persons, and anti-fraud propaganda. For dedicated police patrols, the squad's command, control, and operations center implements a 24-hour "three-monitor, four-command" mechanism, expanding from "citywide police patrols" to "citywide patrols," enhancing risk prevention and public outreach.

Collaborating with the big data squad, it supports dedicated and social patrol units in participating in street patrols, such as checking cars for unlocked doors or open windows, taking photos, and uploading them with vehicle status and license plate numbers. The system automatically recognizes and sends safety reminders to car owners, enhancing public awareness.

The mini-program also supports incident reporting via text, images, videos, and location, enabling rapid response. Equipped with 4G visual mobile terminals, it enables video preview, remote shouting, and real-time location. Responding officers can remotely view the scene and guide social patrols for an initial response, enhancing police-civilian interaction and upgrading the "three-party, four-link" mechanism. Additionally, the smart police stations serve as the "cerebellum" of street technical prevention, managing multiple forces, including patrol police, traffic police, traffic security, police stations, agency police, social patrols, and security volunteers.

4.4 Achievements in Governance

Through digital and intelligent means, "Longcheng Safe e-Patrol" has built an efficient patrol system, enhancing public security management. Since 2024, it has amassed 97,700 users, with 7,680 daily opens and 42,300 daily page views. By July 9, 2024, the city had established 2,428 social patrol fulcrums, mobilizing 8,204 social patrol forces, including 3,158 in schools, hospitals, and large supermarkets, boosting the overall prevention and control effectiveness of the gridded patrol system. A total of 664 "four-type early warning instructions" were pushed, leading to the arrest of 353 criminal suspects, the investigation of 140 high-risk street property crime offenders, and the recovery of 259 missing persons.

The "Longcheng Safe e-Patrol" system represents a crucial practice in digital policing. It promotes the digital transformation of public security agencies, offering modern, intelligent solutions for policing management. This transformation not only improves efficiency but also aligns policing with technological and informational advancements, meeting modern societal needs. The system strengthens social security control and management, safeguarding social order, stability, and development, effectively combating crime, protecting citizens' rights, and contributing to economic growth and social harmony.

4.5 Issues and Challenges

In leveraging advanced information technology to build the patrol management platform, "Longcheng Safe e-Patrol" involves collecting and using vast amounts of personal data, posing challenges in balancing efficiency and privacy protection. In this digital era, data is crucial, but privacy protection is equally important. Rapid technological advancements mean continuous hardware and software upgrades, requiring sustained funding, professional training, daily maintenance, and upgrades.

As the core of policing, the platform stores and manages massive amounts of sensitive data. Leaks or misuse could severely impact individuals, society, and national security. Ensuring data security, preventing leaks, and resisting cyberattacks are critical issues. Additionally, some citizens have reservations about digital policing. Balancing efficiency, transparency, and public rights is a challenge, necessitating robust institutional mechanisms and oversight systems to safeguard legality, transparency, public rights, and trust in digital policing.

5. Conclusion and Prospects

This study, focusing on the digital patrol system from the perspective of "Peaceful China," takes the "Longcheng Safe E-Patrol" project in Changzhou as a case study, deeply exploring the innovative practices and their effectiveness of the digital patrol system in modern social security management. The research reveals that the digital patrol system, by integrating advanced technologies such as big data and artificial intelligence, has achieved comprehensive coverage, rapid response, and efficient coordination in patrol work, significantly enhancing the effectiveness of social security prevention

and control. Notably, the "Longcheng Safe E-Patrol" project, through establishing a new model of smart governance involving both police forces and social forces, has not only optimized the layout of patrol forces but also realized information sharing and collaborative operations, providing valuable lessons for the development of patrol systems in other regions. The findings of this study contribute a theoretical framework and practical case studies to promoting China's social security prevention and control capabilities and levels.

Despite certain advancements made in constructing the digital patrol system and evaluating its effectiveness, this study still has limitations. Firstly, the data sources are relatively limited, primarily relying on the practical case of the "Longcheng Safe E-Patrol" project in Changzhou, failing to encompass more regions and types of patrol systems, which to some extent restricts the universality of the research conclusions. Secondly, the practical verification of the proposed solutions is relatively weak. Although strategies such as optimizing the layout of patrol forces and strengthening multi-departmental collaboration have been put forward, their actual effectiveness still needs to be tested and refined through broader practices.

Looking ahead, future research should further expand data sources, enhancing data diversity and representativeness to more comprehensively reflect the application effects of the digital patrol system in different environments. Meanwhile, empirical research should be strengthened by establishing pilot sites, conducting follow-up evaluations, and other means to intuitively test the effectiveness of optimization strategies and continuously optimize and adjust accordingly. Additionally, the depth of interdisciplinary integration needs to be further strengthened. Collaborations with fields such as public administration, sociology, and information technology will facilitate knowledge sharing and theoretical innovation, providing robust support for constructing a more scientific and systematic digital patrol system. Lastly, continuous attention should be paid to technological innovations and changes in the social security landscape, with adjustments and improvements made to the patrol system to meet the needs of future social governance.

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