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Artificial Intelligence Empowering the Modernization of Super-Urban Governance in Chengdu: Mechanism Logic and Effectiveness Evaluation

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Abstract: Megacity governance faces the dual challenges of institutional compatibility and technological empowerment as a result of the in-depth application of artificial intelligence (AI) in the public sector. A critical and cutting-edge topic in urban governance research is how to integrate AI into the megacity governance system to boost governance efficacy. Existing studies mostly focus on macro-institutional analysis or quantitative efficiency evaluation, and lack in-depth qualitative examination of the specific mechanisms and practical effects of AI-enabled governance in China's megacities. Using Chengdu, a megacity in western China with a permanent population of more than 21.47 million, as the research object, this study takes technological empowerment theory, collaborative governance theory, and refined governance theory as its analytical framework, and adopts case study and literature review methods. Four representative cases are selected: the Smart Chengdu Command Center, AI application in grassroots micro-grid and practical grid, AI application scenario for Park City ecological governance, and AI-enabled government services. The study systematically examines the mechanisms by which AI facilitates the modernization of governance in Chengdu's megacity, assessing its efficacy across four dimensions: enhancement of public services, optimization of governance efficiency, improvement of social collaboration, and advancement of risk prevention and control.The study finds that Chengdu's practice has created a framework that focuses on empowerment and has made progress in many areas. But it still needs to do a lot more to get rid of data barriers, make algorithms clearer, and show people how to use technology.

Keywords: Artificial Intelligence; Mega-city Governance; Governance Modernization; Chengdu; Qualitative Research; Empowerment Mechanism

1. Introduction

The structural tension between urban scale expansion and governance capacity has long been the focus of urban governance studies. Entering the third decade of the 21st century, the rapid advancement of artificial intelligence (AI) has injected a new variable into this classic proposition. Margetts and Dorobantu argue in a paper published in Nature that AI is fundamentally transforming the interaction between governments and citizens, which necessitates the public sector to re-examine its service delivery models and decision-making mechanisms[1]. In the realm of urban governance, AI technologies such as deep learning, natural language processing, and computer vision have progressively transitioned from supplementary tools to integral components inside the governing framework. In his analysis of the relationship between AI and smart cities, Batty emphasizes that AI not only optimizes urban operational efficiency but also reshapes the governance logic of urban space at a deeper level[2]. This subject has continued to be of great importance to academia in the United States. Yu Keping came up with the idea of good governance earlier. Its principles of legitimacy, responsiveness, and transparency provide a normative reference for understanding governance transformation in the context of technological empowerment[3]. Concepts from classical governance thought are also consistent with contemporary urban governance. According to Guanzi·Mu Min, good government is when it follows what the people want, which reveals the enduring proposition that governance should respond to public needs[4].

Megacities, as highly concentrated and functionally complex governance units, have a particularly pressing need to advance governance modernization. China is home to several megacities with a permanent population of more than 10 million, which face significantly greater pressure than small and medium-sized cities in grassroots social governance, public service delivery, and emergency management and response. Chen Shuisheng and Luo Dan observed that the modernization of spatial governance in China's megacities is confronted with four basic spatial characteristics and corresponding governance challenges: ultra-large scale, high complexity, rapid mobility, and multi-dimensional risks[5]. The use of artificial intelligence (AI) technology has opened up new ways to deal with this problem. In the past few years, several megacities in China have been actively looking into how to use AI in city government and have come up with unique practical models. As the only megacity in western China with a permanent population exceeding 20 million[6], Chengdu's practical path of AI-enabled governance carries significant research value.

However, academic studies on AI-enabled megacity governance still have clear limitations in the following dimensions. Theoretically, mechanism analysis and efficacy evaluation are disconnected. Most studies either focus on describing the

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functions of AI technology itself or on the quantitative analysis of governance performance indicators. Few studies have organically integrated the logical interpretation of the enabling mechanism with the systematic evaluation of governance effectiveness. Wirtz, Weyerer, and Geyer noted in their review of AI applications in the public sector that existing research lacks detailed process-based analysis of the specific pathways through which technology is embedded into governance systems[7] . A study by Sun and Medaglia on AI applications in public health similarly reveals that most research in this field remains at the conceptual discussion stage, with in-depth research of real-world examples still not enough[8].

Most domestic studies adopt statistical analysis or questionnaire surveys, and fail to sufficiently examine issues such as actor interactions, institutional logic, and scenario construction in the enabling process. Zuiderwijk, Chen, and Salem (2021) explicitly called for AI governance research to focus on specific countries, regions, and scenarios and to conduct targeted in-depth studies[9]. Academic research on the theoretical summarization and mechanism analysis of this practice is still in its early stages, despite Chengdu's recent systematic exploration of AI-enabled urban governance within the framework of the Smart Chengdu development initiative[10].

This study adopts technological empowerment theory, collaborative governance theory, and refined governance theory as its analytical framework to address the above issues. It uses qualitative research methodologies, such as case studies and literature reviews. This study selects four representative scenarios from Chengdu's AI-enabled governance practices in accordance with the purposive sampling principle elaborated by Yin[11]: First, the Smart Chengdu Command Center, which represents the comprehensive governance platform at the municipal level; Second, the application of artificial intelligence in the community-level micro-net and practical grid system, representing refined governance practices at the grassroots level; Third, the AI scenario for ecological governance in the Park City, which represents specialized governance in the ecological and environmental field; Fourth, the AI-enabled scenario for government services, which represents governance innovation in the public service sector. These four cases cover two dimensions: the municipal-grassroots level and the comprehensive-specialized dimension, forming a multi-level and multi-domain case portfolio. The literature review entails the methodical aggregation and content analysis of Chinese and international academic journal articles, policy documents, governmental reports, and official statistical data. The study design, which includes comparing multiple cases and checking the literature, is meant to make qualitative research more reliable and valid.

2 Theoretical Basis and Definition of Core Concepts

2.1 Relevant Theories on AI-Enabled Urban Governance

In The Responsive City, Goldsmith and Crawford proposed that digital technologies enable urban governments to perceive and respond to public needs in real time. Such capacity, however, is not automatically generated by technology itself, but relies on the coordination of institutional design and organizational transformation[12]. According to the Digital Era Governance framework proposed by Dunleavy et al., the integration of organizational structures and process reengineering are necessary for information technology to have an empowering effect on the public sector [13]. According to Xue Lan, technology-enabled practices are emerging as a new driving force for building multi-stakeholder interactive relationships and optimizing governance structures in the Chinese context[14]. Technology Empowerment Theory serves as the analytical starting point for this study to understand how artificial intelligence transforms from an external tool to an endogenous capability.

Collaborative Governance Theory focuses on the interactive and cooperative mechanisms of multiple stakeholders in public affairs. Ansell and Gash characterized collaborative governance as the direct involvement of public institutions and non-governmental stakeholders in a formal, consensus-driven collective decision-making process[15]. The meaning of collaborative governance has grown a lot in the context of AI-enabled urban governance. AI platforms serve as a technological foundation for data sharing and decision-making collaboration across sectors and hierarchies, making it possible to break down information barriers within traditional bureaucracies. However, in their study on smart city governance, Meijer and Bolivar cautioned that technology-driven collaboration is deeply constrained by power dynamics, interest patterns, and institutional inertia[16].

Refined Governance Theory focuses on the segmentation of governance targets, the precise matching of governance instruments, and the accurate allocation of governance resources throughout the governance process. In recent years, enhanced governance has been a central focus in the study of Chinese public administration. He Yanling noted that urban governance in China is undergoing a paradigm shift from capital agglomeration-oriented to equilibrium and security-oriented development, with the orderly regulation of capital-driven urban spaces and the balanced allocation of governance resources at its core[17]. The governance idea put forward in Xunzi Kingship, clarify duties and functions, order affairs and undertakings, and appoint officials based on their talents and skills has long illustrated the importance of a refined division of labor for organizational efficiency[18]. Artificial intelligence technology has elevated the refinement of urban governance from the traditional grid-based management stage to that of intelligent perception and assisted decision-making.

2.2 Definition of Core Concepts

Artificial Intelligence (AI) in this study denotes a category of computing systems that replicate human cognitive functions via technologies such as machine learning, computer vision, natural language processing, and deep learning[19]. This study focuses on Narrow AI applications currently employed in urban administration, rather than Artificial General Intelligence (AGI). Some of these are intelligent decision support systems, automated data analysis platforms, intelligent robots for customer service and government affairs, and more. This definition makes sure that the research object can be clearly seen in real life.

Megacity governance modernization is a composite concept. In China, megacities are cities with a permanent urban population of more than 10 million people[20]. The modernization of megacity governance is in line with the general goal of updating the national governance system and capacity set out at the Third Plenary Session of the 18th Central Committee of the Communist Party of China. At the level of cities, this is shown by new ideas about how to run things, better systems for running things, new tools for running things, and better ways to run things. This paper characterizes megacity governance modernization as a continuous process whereby megacities get structured governance frameworks, enhanced governance capacity, and quantifiable governance effectiveness, propelled by both institutional and technical innovation. This definition is different from the simple idea of digitalizing cities. The latter focuses on digital transformation at the technical level, while the former encompasses comprehensive changes at the institutional, organizational, and value levels. In this study, governance effectiveness refers to the actual effects and social value produced by AI-enabled urban governance, which is examined from four dimensions: enhancing public services, optimizing governance efficiency, strengthening social collaboration, and improving risk prevention and control[21]. Governance effectiveness is different from technical efficiency; it has a richer connotation and covers the extent to which public value is realized.

The empowerment mechanism is the core analytical concept of this study. It refers to the institutional arrangements and operational modes through which artificial intelligence technology, after being embedded into the urban governance system, transforms its potential into governance capacity via specific paths and interactive processes. The empowerment mechanism emphasizes not the functional attributes of technology itself, but the mutual construction process between technology, institutions, organizations and actors[22]. This concept differs from technology application: the latter describes the deployment and use of technology, while the former focuses on how technology generates new governance capacity in an institutional environment.

3 The Mechanism Logic of AI-enabled Modernization of Megacity Governance in Chengdu

3.1 Technology Embedding Mechanism: The Strong Link Between AI and Urban Governance Infrastructure

Chengdu's Smart City Command Center evolved via iterative refinement, yet like most cross-departmental data integration initiatives, it encountered substantial implementation challenges[23]. The center mainly integrates real time data from public security, transportation, environmental protection, and urban management to form a unified platform, where AI tools can keep track of daily operations and spot abnormal conditions that might otherwise be neglected in separate departmental systems; although its overall objective is straightforward, its actual implementation turned out to be far more complicated than expected, since challenges arose from both technical constraints and long standing institutional arrangements that were much more closely interconnected than designers had foreseen. Many departments had developed their own independent data systems over extended periods with different formats and standards, and they were often unwilling to share information they regarded as sensitive or essential to their routine work, while commercial AI models could not be directly applied in Chengdu but had to be extensively retrained and adjusted using local data to adapt to the city's distinctive geographical and demographic features[24].

The city government has decided to put urgent applications first and carry out projects in stages as part of the Smart Chengdu project[25]. It has put the most important AI applications in areas that need them right away and have a lot of good data, like traffic management and early warning systems for floods. These applications have been slowly expanded to more areas of governance after getting phased results. This progressive embedding approach has successfully diminished the institutional risks associated with technology adoption. The State Council's 2017 New Generation Artificial Intelligence Development Plan gives local governments a big-picture policy framework for using AI[26]. Chengdu has come up with a different technology embedding strategy based on the needs of the area within this framework.

3.2 Collaborative Linkage Mechanism: Cross-departmental and Cross-hierarchical Governance Coordination

Vertically, the Smart Chengdu platform has realized the connectivity of governance information across four levels: municipal, district (county), sub-district (township), and community (village). Using the Micro-Network and Refined Grid social governance platform, the problem data collected by grid administrators in the grassroots micro-grid governance system[27] supports the establishment of an event reporting, task assignment, and closed-loop disposal mechanism, captures public feedback in a timely manner, and forms a complete governance closed loop[28]. Horizontally, the artificial intelligence platform has opened up data channels among public security, ecological environment, market regulation, urban management, and other departments, making cross-departmental joint research, judgment, and collaborative response normalized.

The key to this mechanism is that artificial intelligence not only acts as a channel for information transmission but also performs intelligent scheduling. Through a comprehensive evaluation of multi-dimensional information such as incident urgency, involved sectors, and response resources, the system automatically generates recommended disposal plans and reduces time losses caused by the traditional hierarchical reporting and approval process. Ansell and Gash's analytical framework for collaborative governance emphasizes that information symmetry and trust-building are critical to effective collaboration[29]. The issue of information asymmetry has been mitigated to a certain extent by Chengdu's artificial intelligence platform, but to develop trust, changes to institutional arrangements and organizational culture are still needed. Chen Zhenming also pointed out that the technological logic of China's government governance reform should not be simplified as technological determinism, and institutional adaptation and technological iteration must be advanced in tandem[30].

3.3 Scenario Reconstruction Mechanism: Digital Reconstruction of Governance Scenarios

AI-enabled urban governance goes beyond just moving traditional governance processes online; it changes the scenarios and boundaries of governance in a deeper way. The use of AI in ecological governance during the building of Chengdu's Park City is a good example of the scenario reconstruction mechanism[31]. Traditional urban ecological governance depends on manual inspections and regular monitoring, which can cause delays and gaps in information gathering.Chengdu has set up computer vision-based automatic monitoring systems in major rivers, green spaces, and nature reserves since it started using artificial intelligence technology. These systems can find environmental risks like changes in plants, bad water quality, and illegal dumping right away and automatically start early warning and response procedures. This change is more than just a technical upgrade; it changes the way governments work in every way. For example, ecological governance has gone from responding to events after they happen to perceiving them in real time and from being labor-intensive to being helped by intelligence.[32].

Scenario reconstruction in the field of government services is also of great research value. Chengdu's government service platform has realized intelligent approval and proactive service delivery for some high-frequency government affairs items after introducing artificial intelligence technology[33]. Taking enterprise establishment as an example, the artificial intelligence system automatically matches applicable policy conditions based on the basic information submitted by applicants, pre-checks the completeness and compliance of materials, and significantly shortens the approval cycle. This phenomenon is referred to by Engin and Treleaven as algorithmic government, meaning the intelligent transformation of the public domain through data science and technology[34]. Barber posits in his book If Mayors Ruled the World that innovation in urban administration frequently occurs inside specific service contexts rather than at the level of abstract institutional design [35]. Chengdu's scenario reconstruction in government services provides practical evidence to support this claim.

3.4 Precise Response Mechanism: Intelligent Identification and Matching of Public Need

The fundamental goal of urban governance is to respond to public needs. The introduction of artificial intelligence has shifted demand identification from coarse-grained to fine-grained and demand response from passive acceptance to proactive service.

The exact way that Chengdu's grassroots governance works has three steps. During the demand identification stage, the AI system looks at all the information that grid administrators have reported, as well as data from the citizen hotline (12345) and public opinion on social media. It automatically finds problems and possible risks that happen often in the area, creating a community problem profile[36]. During the demand analysis phase, AI algorithms rank and categorize the needs that have been found, separating routine problems from emergencies. This gives a basis for deciding how to use resources. During the demand matching stage, the system automatically links the analytical results to governance resources that can be used and sends them to the right people.

4 Effectiveness Evaluation of AI-Empowered Modernization of Mega-City Governance in Chengdu

This chapter adopts qualitative research methods and assesses the actual effectiveness of AI-empowered governance from four dimensions, combined with the specific governance scenarios of Chengdu.The evaluation materials are sourced from official government reports, policy papers, news articles, and case studies in academic writing. The evaluation of the position of seeking to maintain an objective balance not only presents the results of governance, but also reflects on its limitations.

4.1 Dimension of Public Service Improvement

The most direct effect of AI-empowered governance is reflected in the accessibility and convenience of public services. The application of artificial intelligence in Chengdu's government services has significantly improved the experience of citizens and enterprises in handling administrative affairs.The Rongyiban platform integrates intelligent guidance, intelligent preliminary review, and intelligent customer service functions. Citizens can describe their needs in natural language, and the system will automatically match the corresponding administrative items and guide them in preparing the required materials. The application lowers the threshold of access to government services, which is especially significant for ordinary citizens who are not familiar with administrative approval procedures. At the level of community public services, based on the analysis of community population structure and service needs by artificial intelligence, it provides more scientific decision-making support for the construction of the 15-minute public service circle[37]. According to Criado and Gil-Garcia, the key to creating public value through intelligent technology lies in whether it can effectively meet the diversified needs of the public, and Chengdu's practice provides valuable exploration in this regard. However, a notable limitation is that AI-assisted public services still face the challenge of the digital divide[38].

Older people, people with disabilities, and people who don't know much about computers still have trouble getting AI-driven services[39]. Chengdu's establishment of offline backups is a prudent step, yet the seamless, fair, and effective partnership between people and machines requires our constant focus. It is an ongoing effort to audit, refine, and build.

4.2 Dimension of Governance Efficiency Optimization

AI-empowered governance has significantly improved the operational efficiency of urban governance, which is particularly prominent in emergency management and urban operation monitoring. Since the Smart Chengdu Command Center was put into operation, the average time from the detection to the resolution of urban incidents has been greatly shortened. Taking urban management incidents as an example, under the traditional model, public complaints went through multiple procedures, including acceptance, dispatch, verification, handling, and feedback, resulting in a long processing cycle. The application of artificial intelligence systems has greatly improved the efficiency of automatic incident identification and intelligent dispatch, with the efficiency rate exceeding 90%[40]. In the field of traffic management, the deployment of an AI-based traffic signal optimization system along major traffic corridors in Chengdu has improved traffic conditions during peak hours.[41]

The impact of improving efficiency varies a lot across different areas of governance. Some areas have made big strides in efficiency because they have sound data and highly standardized processes. In contrast, the auxiliary role of AI remains relatively limited in fields involving complex interest adjustments, such as the resolution of grassroots conflicts and the handling of long-term historical issues. Such a job still depends a lot on people making decisions and working together. The warning put forward by Vogl and other scholars in their research on algorithmic bureaucracy deserves attention: automated processes may give rise to the problem of decision rigidity when handling non-standardized tasks [42]. This indicates that algorithms tend to follow existing patterns and lack flexibility when confronted with atypical scenarios.

4.3 Dimension of Social Collaboration Enhancement

In Chengdu's Micro-Network and Practical Grid governance system, AI technologies have facilitated interaction between the government and community residents to a certain extent. Smart tools for collecting information and giving feedback have made it cheaper for people to take part in community governance. Via mobile terminals, residents can report problems, monitor disposal progress, and evaluate service quality, forming a lightweight form of participation. From the standpoint of collaborative governance theory, these low-threshold participation channels contribute to the expansion of the social foundation of governance.

The openness of AI platforms has also expanded channels for market entities and social organizations to engage in urban governance. Chengdu has piloted the Community Partners mechanism in some communities [43], incorporating volunteer groups, social enterprises, and other entities into the digital platform for community governance and using data sharing to achieve precise matching of service supply and demand. Mergel, Edelmann, and Haug stress in their study on digital transformation that the digitalization of the public sector should open interfaces for social collaboration rather than be restricted to internal process optimization [44]. Chengdu's practice has made an exploratory attempt in this regard.

The fact that structural reasons continue to limit the scope and depth of social collaboration merits careful consideration. Residents' excitement for involvement is determined by a number of elements, including interest relevance, time cost, and degree of trust, even though AI platforms offer technological prerequisites. According to Putnam's seminal study on social capital, the degree of civic engagement is dependent on the strength of social networks and trust, and technological empowerment cannot take the role of building social capital[45].

4.4 Dimension of Risk Prevention and Control Improvement

The real chance we have is to use AI not just as a tool that responds to our needs, but as a basic system for understanding and dealing with the complex risks that come with living in a megacity.In recent years, Chengdu has gradually introduced artificial intelligence technologies into its daily work concerning flood control, emergency response, and geological disaster monitoring, and these AI-based systems are far more than simple early-warning tools because they can constantly collect real-time information from weather stations, hydrological stations, and geological monitoring equipment, turning large quantities of unprocessed data into clear and practical risk levels so that on-site managers can make quick and reasonable decisions within a limited time; the real value of such technology lies not only in the large amount of data it can process but also in its high operating efficiency, since with the support of machine learning models built on historical runoff and soil moisture data, the interval between the identification of potential dangers and the release of official warnings has been greatly reduced, which is an effect that traditional manual analysis can hardly achieve. The 2023 flood season provides a practical example, when continuous heavy rainfall brought serious risks to low-lying areas in Pidu and Xindu districts, the city’s integrated early-warning system identified potential threats in advance, which allowed local governments to promptly organize residents to move to safe areas and arrange emergency supplies in advance before the flood came. Kuziemski and Misuraca pointed out that the application of AI in public services requires strict and long-term institutional supervision and complete ethical review rather than just simple preliminary approval[46], which is particularly important when such systems involve the daily activities of a large number of residents; in addition, Janssen and other scholars stressed that effective AI governance must be based on sound data governance, including clear regulations on data collection, applicable scenarios, and responsibility allocation[47]. Although AI applications in risk prevention and control have achieved notable effects, they also have several shortcomings. The accuracy of AI models' predictions is still limited by the quality of the data and the number of training samples. Due to the lack of sufficient historical data on extreme and rare events, the reliability of AI predictions needs to be verified. The above problems indicate that in risk prevention and control, AI should be positioned as an auxiliary tool rather than a substitute, and human professional judgment remains indispensable.

5 Discussion

The previous analysis of the mechanism and evaluation of its effectiveness has shown the practical logic and step-by-step progress of Chengdu's AI-enabled megacity governance.This part talks about Chengdu's practices from an international point of view and thinks about their limits.

Judging from international practice, some representative cases provide important references for artificial intelligence to empower urban governance. The “Smart Nation” program implemented by Singapore is regarded as a landmark project in the construction of smart cities in the Asia-Pacific region. Its core is to promote the integration and sharing of government data and cross-departmental collaborative governance through top-level design and unified data platform construction at the national level, so as to achieve holistic intelligent governance [48]. Tokyo has accumulated rich experience in AI-supported traffic management and disaster prevention and mitigation, achieving remarkable results, particularly in early earthquake warning and public transportation optimization [49]. The NYC Analytics program in New York City wants to use data analysis and artificial intelligence to improve the delivery of city services and the evaluation of policies [50]. A survey by van Noordt and Misuraca on AI applications in the public sectors of EU member states shows that European countries place greater emphasis on ethical norms and citizen participation mechanisms for AI deployment [51].

Chengdu's practices show a number of differences from those of the cities and areas listed above. Chengdu has about 20 million permanent residents and a well-known urban-rural dual structure, which makes its governance very large and complicated. AI-enabled governance needs to cover both highly urbanized areas and vast rural regions simultaneously. Such complexity is rarely observed in large metropolitan governance systems such as those of Tokyo, New York, and Singapore. In terms of institutional advantages and coordination efficiency, China's administrative system provides institutional guarantees for cross-departmental data integration and joint platform development. The four-level connectivity of the Smart Chengdu platform from the municipal level down to the community level is partly attributed to top-down organizational impetus. In his research, Goldsmith noted that political leadership and organizational coordination capabilities were critical to the success of urban digital governance [52], and Chengdu has comparative advantages in this regard. Ecological governance now occupies a prominent position in Chengdu's AI-enabled governance framework thanks to the embedding of the Park City concept, which distinguishes Chengdu from most international cities.
We can't ignore the problems with Chengdu's practices. The primary challenge is that data barriers have not been fully removed; data from some vertically administered departments has not yet been integrated into the unified platform, and cross-system data standards still need to be further unified [53]. Another ongoing problem is that algorithmic systems aren't clear or easy to understand. When artificial intelligence systems assist public decision-making, the opacity of algorithmic logic may undermine public trust. In her research on the ethical governance of artificial intelligence, Cath emphasizes that the legitimacy of algorithmic decision-making depends on the reviewability of the decision-making process [54]. Busuioc further points out that it is necessary to establish operational algorithmic accountability mechanisms for AI applications in the public sector [55]. The uneven digital literacy of grassroots staff also restricts the full release of AI's empowering effect. Some grassroots workers only use AI systems passively and have not yet developed a data-driven decision-making mindset.
The following enhancements can be implemented to address the aforementioned constraints: speed up the institutionalization of cross-departmental data sharing and the development of data standardization; create an algorithmic impact assessment system for the public sector to make AI-assisted decision-making more open and accountable; and add AI tool application and data analysis capabilities to the capacity-building system for grassroots cadres to strengthen the human foundation for AI empowerment.

6 Conclusions

This study utilizes Chengdu as a case study and employs technological empowerment theory, collaborative governance theory, and refined governance theory as its analytical framework. It methodically analyzes the mechanistic rationale behind AI-driven modernization of megacity governance using case studies and literature review methodologies, and performs an effectiveness evaluation from four perspectives. The research indicates that Chengdu's AI-enhanced governance practices have established four interconnected empowerment mechanisms. The technology embedding mechanism lowers institutional risks and shows how closely artificial intelligence and urban governance infrastructure are connected by using an incremental strategy. AI platforms act as smart coordinators that help information flows and decision-making chains between departments and levels of government work together through a collaborative linking mechanism.The scenario reconstruction mechanism has changed how governance works in areas like public services and ecological management. This is part of a bigger change from reacting to problems to sensing them before they happen. At the same time, urban governance has become more responsive to the real needs of residents because the precise response mechanism makes it easier to match resources with public needs. At the effectiveness level, AI empowerment has led to gradual improvements in risk prevention and control, access to public services, the efficiency of governance operations, and social collaboration channels. However, persistent structural hurdles remain in key areas: algorithmic transparency, digital literacy at the community level, and institutional data sharing.

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