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Research Article

The Organizational Structure and Operational Logic of an Urban Smart Governance Information Platform: Discussion on the Background of Urban Governance Transformation in China

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At present, the Chinese government is trying to resolve various social contradictions, such as people's ever-growing need for a better life and unbalanced and inadequate development. To do so, urban governance practices including holistic governance, decentralized and interconnected governance, multiple participatory governance, and smart governance have been developed in China. Urban smart governance supported by mobile Internet, the Internet of Things, quantum computing, big data, artificial intelligence, and other information technologies has also entered the field of vision of academics and administrators. However, the research and practice on the integration of organizational structure and smart governance technology for urban governance in China are still insufficient. Hence, this paper proposes the design of the organizational structure of an urban smart governance platform and presents the "1 + *N*" integrated smart information platform and the "power-sharing linkage, one-center and dual-track" platform construction command system. In this system, the functional module of the information platform for smart urban governance is elaborated. This paper contributes to promoting the modernization of China's urban governance capacity, which can enhance social equity and social order, promote social democracy and rule of law, and enhance the efficiency of urban governance.

1. Introduction

On April 19, 2016, Chinese President Xi Jinping stated "In the process of promoting the modernization of the national governance system and governance capacity through information technology, we need to coordinate the development of e-government and build an integrated online service platform to perceive social trends, smooth communication channels and assist scientific decision-making" [1]. Since then, the informatization of urban governance has boomed in China. In addition to the government's active promotion, the rapid development of and changes in Chinese cities and the promotion of information technology have accelerated the informatization of urban governance. This paper aims to identify the trends of China's urban governance transformation to design a governance organization structure and to elaborate on the structure's basic operational logic according to the information platform of urban smart governance. "1 + *n*" smart city takes "wisdom, wisdom and efficiency" as the construction concept, relying on the core technologies such as artificial intelligence, blockchain, and cloud computing, to build a "1 + *n*" smart city platform system, with a set of "smart city cloud" platform to strongly support *n* smart city plates, including smart life, government affairs, transportation, education, health, hospital, food safety, port, environmental protection, pension, law, and community.

2. Research Background and Literature Review

At present, many countries have begun to build smart cities, mainly in the United States, Sweden, Ireland, Germany, France in Europe, and China, Singapore, Japan, and South Korea in Asia. The construction of smart cities in most countries is in the stage of limited scale and small-scale

exploration. As the world's fourth largest manufacturer of electronic products, South Korea is one of the leading countries in the formulation of international standards for the Internet of Things, cultivating new industries through the construction of smart city. The United States has raised the construction of smart city to the height of national strategy and made key investment and construction in infrastructure and smart grid. Singapore is recognized as the country with the best government service. Information and communication technology promotes economic growth and social progress. The construction of smart city focuses on serving the public [2].

China's smart city construction has just started, and the urban informatization construction is in an important structural transformation period, that is, from the stage of information technology popularization and application to the stage of information resources development and utilization. China is actively making use of the latest technologies such as the Internet of Things and cloud computing to promote the construction of smart city through the strategic deployment of "integration of industrialization and industrialization," "simultaneous development of five modernizations," and "integration of three networks." At present, there are three construction modes of smart city construction in China, which are the construction mode driven by the development of Internet of Things industry, such as Wuxi; the construction mode guided by the construction of information infrastructure, such as Wuhan; and the construction mode with social service and management application as the breakthrough, such as Beijing and Chongqing.

Analyzing the connotation of the word "smart" is the premise of understanding the concept of "urban smart governance." The word "smart" has different origins and meanings. In Chinese, "smart" [3] means "the ability to distinguish right from wrong and to invent something." In English, it refers to "having or showing a high degree of mental ability" or "witty, clever" [4]. These two definitions convey two meanings: the ability to perceive things and the ability to manage things, respectively. Smartness is the key to government reform strategies worldwide [5].

Smart governance can be defined as "a deployment of the creative mix of emerging technologies and innovation in the public sector" [6] that can cope with complex and difficult challenges to promote innovation, sustainability, and competitiveness in society [7]. In recent years, smart governance has attracted increasing attention.

A team of researchers led by Giffinger of the Technical University of Vienna began a comprehensive assessment of the development of smart cities in Europe in 2007 [8]. The level of smart governance in cities was seen as one of the most important aspects of the assessment, which focused on public participation in decision-making, transparency, and public services. Alenezi et al. [9] regarded smart governance as a governance model based on e-government innovation. Rochet et al. [10] believed that smart governance is business processing and information communication based on information and communication technologies (ICT), with the aim to improve service quality. Some researchers [11–14] agreed that ICT plays an important role in urban governance. Information technology and many disciplinary approaches, for example, have been adopted to help cities improve the use of services and infrastructure and balance the sustainability of social, economic, and environmental impacts. In addition, Ronan [15] noted that smart governance is a government service that is guided by public services and makes full use of various data, information, and advanced ICT to provide smarter and higher-quality services to the public. Nada et al. [16] defined smart urban governance as smart, intelligent urban public service management and public participation. Lv et al. [17] illustrated that ICT has been used by the government to facilitate interdepartmental data sharing and achieve more open and sustainable government services.

With the implementation of the urbanization strategy, increasing attention has been paid to the level of smart governance in China. Related theoretical research and practice have increased simultaneously. According to Cui and Guo [18], urban smart governance takes the whole urban system as the governance object and constructs a smart decision-making mechanism through information technology to make urban public services more standardized, transparent, and efficient through open interaction between the government, markets, and society. Wang [19] reported that urban smart governance covers both management and service, with an emphasis on smart management and control and smart service. Nie [20] emphasized that the government has made full use of big data, mobilized social forces, and formed a pluralistic cogovernance pattern. Gao [21] believed that the use of modern information technology by the government transforms the relationship among the government, citizens, and society and that various departments within the government can realize power sharing, innovative communication, and supervision methods and shape an efficient modern governance model.

In light of the above literature review, this paper defines urban smart governance as the elimination of information islands between government departments, the full use of advanced ICT to collect data in real time, and data sharing and intercommunication between government departments. By processing and analyzing big data through cloud computing and artificial intelligence, we can offer more accurate, smarter, more efficient, and higher-quality government services oriented to public services and ultimately promote harmonious and sustainable urban development.

Academia generally believes that information platforms of urban smart governance are the key to bridging the gap between technology and governance [22, 23]. However, the unreasonable design of existing information platforms for urban governance leads to a gap between data collection and application [24]. Urban smart governance is not the function of a single department but involves many departments. If the government relied on the promotion of one department alone, it would not be able to succeed. However, the disorderly participation of all departments would lead to difficult coordination. Therefore, a unified deployment of the city government is needed [25]. In the management of the Chinese government's data resources, there are two main

problems: the isomorphism of responsibilities and the highly fragmented and segmentary system. The independence and estrangement between the upper and lower levels of government departments, as well as the conflicts and contradictions between municipal departments at the same level, lead to a situation in which horizontal data can be neither aggregated nor shared and vertical data can be shared neither upward nor downward [26].

At present, the research on urban smart governance is still in the stage of theoretical exploration, and there are relatively few studies and practices related to smart governance considering the characteristics of China's urban governance system. Urban smart governance is a systematic project, and it is urgent to integrate information technology and governance systems, improve the existing governance system through the construction of urban smart governance information platforms, and form an organizational structure and governance model of urban smart governance with clear rights and responsibilities.

3. The Trend of Urban Governance Transformation in China

In the academic field, "smart governance" is a concept that has been widely discussed and spread in recent years. It is generally discussed in the context of governance capacity and systems. Therefore, the discussion on urban smart governance must be based on the practical problems of urban governance; otherwise, the academic discussion will lose a practical basis. It not only relates to technical problems but also includes the concept, values, and behavioral process of urban governance.

Correspondingly, the current situation and trend of urban governance in application need to be analyzed in advance in order to clarify the real demand for urban governance and further solve problems.

3.1. Trend One: Holistic Governance. The purpose of China's "comprehensive urban management" system is to transform urban governance from decentralized to comprehensive governance. The main characteristics of a comprehensive urban management system are embodied in the functions of "centralization" and "linkage." Centralization aims to provide good services, improve management, enhance law enforcement, and centralize the management and punishment power involved in urban management into one functional department in order to integrate urban management and administrative law enforcement and to improve administrative and service efficiency. Linkage refers to the implementation of interdepartmental joint law enforcement for some urban management law enforcement matters that are temporarily difficult to concentrate on in the process of urban management operation, which is embodied in the linkage between similar or related departments. However, the comprehensive urban management system is only a transitional measure in urban governance. To realize the goal of refined management of diversified subjects in a city, government departments must achieve seamless professional coordination and smooth information transmission. Therefore, the government should embrace the concept of holistic management guided by the needs of citizens, use information technology as the governance means, and choose coordination, integration, and responsibility as the governance mechanisms to carry out organic coordination and integration of governance levels, functions, public-private relationships, and information systems and to address other fragmentation issues [27].

Urban governance system reform based on the concept of holistic governance will ultimately establish an administrative system coordinated by integrating service, management, and law enforcement [28]. Configuration of power among local government departments should become into notice, and relevant rights and responsibilities need to be clarified to establish a mechanism for information communication among various functional departments. In addition, a multidepartmental coordinated urban governance pattern should be adopted to strengthen the evaluation of and feedback on the effectiveness of urban governance in order to ensure that urban governance meets the needs of all parties. With the development of information technology, holistic management is not only characterized by "concentration" and "linkage" but also emphasizes governance by means of the full use of information technology and the concept of serving the public. Moreover, it coordinates the function and accountability mechanisms of information systems, governance classes, and public and private sectors to promote collaboration among public service subjects and provide seamless public services to the public [29]. Therefore, holistic governance will inevitably facilitate the development of participatory governance and smart governance in practice.

3.2. Trend Two: Decentralized and Interconnected Governance. Since the beginning of the 21st century, the central government of China has gradually transferred its power to lower levels. "New affairs" generated in the process of urban development have also enabled local governments to naturally acquire power. Thus, city governments have acquired the dominant position of urban governance power. The governance of China's city-level government long used management as its main means, and it has long been featured by comprehensive law enforcement. Local urban management and law enforcement departments belong only to institutions under the jurisdiction of local governments, and even if the government sets up branches, they are basically only at the district level. The function of urban governance of streets and communities, especially their position in the governance system, has not received enough attention. A governance system of decentralization with a unified vertical linkage of "city government-district-street-community" has not been established.

With the development of modern information technology, government reform campaigns have been triggered by the data-opening movement in China. The introduction of information technology has changed the organizational system of the government, thus requiring government

management to change from the previous bureaucratic system to a new organizational framework based on networks and technology [30]. Driven by information technology and the rapid development of cities, the change in the organizational structure is profound; it involves pushing the external boundary of the power structure.

Through our long-term study, we found that in recent years, many city governments have defined the scope of urban management authority because Chinese cities have a principal position in the power of urban governance. City governments have clarified the governance rights and responsibilities of cities, districts, streets, and communities, and the decentralized and interconnected governance model is gradually taking shape in Chinese cities. The reform of urban governance in all parts of China has highlighted the difference in the division of functions between decentralized governance and governments at different levels, with the aim to achieve good coordination between municipal governments and governments at various levels within their jurisdictions based on the division of functions (ref). Municipal governments have systematic plans to promote urban governance within the scope of cities. District governments, street departments, and communities, in accordance with their hierarchical differences, exercise their functions and powers in urban governance within their jurisdiction and cooperate with each other to promote the continuous improvement of urban governance.

3.3. Trend Three: Multiple Participatory Governance. Urban refined management needs to be coordinated by scientific and effective governance systems and mechanisms. There are three typical models of urban governance [31]: government-centered, market-centered, and user-centered. The purpose of urban smart governance is to break the previous single-center, hierarchical, and inefficient governance mechanism and build a new system of collaborative governance that includes intergovernmental governance, public-private governance, and government-society governance.

With the advancement of China's urbanization development and the formation of the social multiplication pattern, the demands of different group interests are expressed more strongly, which has prompted the adjustment of government decision-making to meet the demands of the public interest and responses. The concept of participatory governance encourages the public to participate in urban governance [32]. As the public is the owner of a city, the development and change occurring in the city are closely related to public life. Encouraging the public to participate in urban governance is the meaning of reforming urban management and improving the level of urban governance in the new era. To attract public participation, the first step is to stimulate the public's willingness to participate, and the second step is to smooth the channels of public participation and innovate the ways of public participation. At the same time, it is necessary to establish and improve the feedback mechanism and establish a long-term mechanism of public participation. An urban smart governance information platform is undoubtedly the best way to meet the above demands.

3.4. Trend Four: Smart Governance. As mentioned above, urban smart governance refers to integrating urban governance resources by constantly innovating digital urban management information platforms; making full use of technologies such as the Internet of Things, big data, cloud computing, and mobile Internet to build smart governance platforms; and constructing appropriate systems to improve the service capability of platforms. Smart governance not only emphasizes the management method of digitization but also focuses on expanding the visual and controllable scope of urban governance by means of informatization and digitalization to provide better urban public services, enhance public participation, and realize public value through coordination from management to service. In terms of the governance system, smart governance emphasizes the combination of the government's instrumental rationality and governance's value rationality and pays attention to the transformation of the urban social economy and environment in overall planning to optimize the urban environment and create more suitable living spaces for citizens [33].

The rapid development of information technology in China has affected all aspects of social life and laid the foundation for the practical application of urban smart governance. China is in the information technology era, accompanied by rapid development. Urban governance systems should actively introduce technologies such as big data, cloud computing, and the Internet of Things. With the support of modern information technology, the government can collect and analyze data to grasp the dynamic change process of urban governance for decision-makers in order to better summarize the development and governance rules of urban problems, clarify the follow-up effects of each urban governance measure, and grasp urban development trends. In addition, it is convenient for the government to find problems at the microlevel to improve the wisdom and refinement of urban governance means [34].

3.5. Disadvantages of Current Urban Governance. At present, it is difficult for the data mastered by various departments of the city government to be "open as the normal and confidentiality as the exception." Problems such as lack of data, data closure, and repeated construction of smart platforms are common. This includes not only the external factors such as the lag of the overall urban informatization construction, technical barriers, poor organization, and coordination, but also the internal problems such as the lack of power of the department informatization construction, the data as "private property," and the source of rights. For example, the management foundation of information accounts of a large number of key work such as dismantling illegal and scattered pollution enterprises is weak, the data items and data standards are not unified enough, and the task of multidepartment data aggregation and work standardization is a long way to go; some types of data construction are in the bottleneck position, for example, the existing population signaling data and public security work residence permit data need to be integrated and analyzed to reflect the population characteristics, but there is no

relatively formed solution; a large number of urban and rural planning data need to be integrated into space, but the problem of different base map standards needs to be solved first; some departments, including the development and reform, have done a lot of work in the collection of urban operation data and have strong demands for the cross-sectoral application of data and system. However, there is still a large gap between the barrier-free application of data and the linkage of indicators due to the completion of massive data docking.

3.6. Coordinated Operation Embodies the Advantages of New Smart City. "Serving enterprises, government, and citizens" is the original intention of smart city. It can be said that "cooperative operation" is the biggest feature of the new smart city, and the "$1 + n$" platform architecture is the biggest logic of the new-type city intelligent governance. Whether it is government affairs, medical treatment, education, environmental protection, law, pension, community and urban construction, and other more subdivided fields, the new urban intelligent governance has been deeply cultivated for a long time. It is worth mentioning that the new type of urban intelligent governance not only focuses on helping to improve the level of urban intelligence, but also makes continuous investment in smart poverty alleviation, contributing to winning the battle of poverty alleviation in rural areas. The new smart city has improved the end-to-end solution matrix including intelligent medical quality control, intelligent disease prediction, intelligent triage guidance, intelligent medical imaging screening, intelligent auxiliary diagnosis and treatment, intelligent ICU critical management, and intelligent follow-up patient education. It has covered 700+ intelligent disease auxiliary diagnosis and treatment models of common diseases, about 800 million patients, and has a complete medical knowledge map including drugs, diseases, prescriptions, and risk factors.

4. The Design of the Information Platform of Urban Smart Governance

Based on the previous analysis, the current reform and transformation of urban governance in China are embodied in the framework of decentralized and interconnected governance, where overall governance, participatory governance, and intelligent governance resonate at the same frequency. Such a framework is gradually taking shape. The design of the governance organization structure of an information platform of urban smart governance that meets the actual needs of cities should respond to the transformation trend of urban governance.

4.1. "1 + N" Integrated Intelligent Information Platform. The methodologies of holistic governance and decentralized interconnected governance are adopted to build an information platform for urban smart governance with the basic characteristics of intelligence, informatization, networking, and precision to realize the goal of a multigoverning model of urban governance.

Rónán et al. [15] pointed out that the connotation of smart government governance includes intelligent public services, intelligent social management, and citizen group participation. The "$1 + N$" integrated intelligent information platform aims to build "1" big data resource center and "N" urban governance platforms. This platform covers the content of smart governance and is an open system that expands and reduces its content according to the actual needs of cities (Figure 1).

The platform includes one center, namely, one big data resource center. The big data center is constructed based on cloud computing technology, which combines virtualization, distributed storage, distributed computing, and other technologies with government affairs to ensure the adaptation of advanced technology and government affair applications. Computing, storage, networks, and other basic resources facilitate capacity expansion according to the needs of the application workload. The overall architecture adopts an open design that is compatible with common equipment, mainstream operating systems, virtualization software, and applications in the industry and reduces development, operation, and maintenance costs. The key point of openness is that the function platform can be increased or decreased with changes in the urban governance function. The platform aims to support multiple users and multiple services to ensure that basic resources can be automatically and dynamically scheduled among different applications and users according to their needs. Meanwhile, different businesses can be isolated from each other to ensure the smooth operation of various businesses. The technology and equipment selected for the construction of the big data resource center are advanced, expandable, mature, open, compatible, reliable, safe, and able to control intellectual property. As the infrastructure and supporting platform of urban smart governance, the big data center integrates urban data resources and enhances governance perception. Its most important task is to serve holistic governance.

In the process of constructing this "1N" comprehensive intelligent information platform, in order to better study the distribution of different types of data information in the system, the machine learning and neural network combination model used on this platform will integrate the characteristics of different data categories. The dynamic feature values are attributed to the same data cluster group. When the data feature values of any two groups in the data are not the same, it means that the two types of data feature information are extremely different, and they will be automatically separated into different levels. The data sets are compared with the eigenvalues of the next data. The actual calculation process of the machine learning model and the neural network algorithm can be regarded as the iterative process of repeatedly decreasing the control parameter value (the unique characteristic information of the data in the database) and performing the machine learning algorithm, as shown in Figure 2. Among them, c, x, u, y, and h represent different types of data, and F represents data processing methods.

In the process of automatically classifying data, the neural network algorithm converts the data feature information predicted by the network traffic into the data

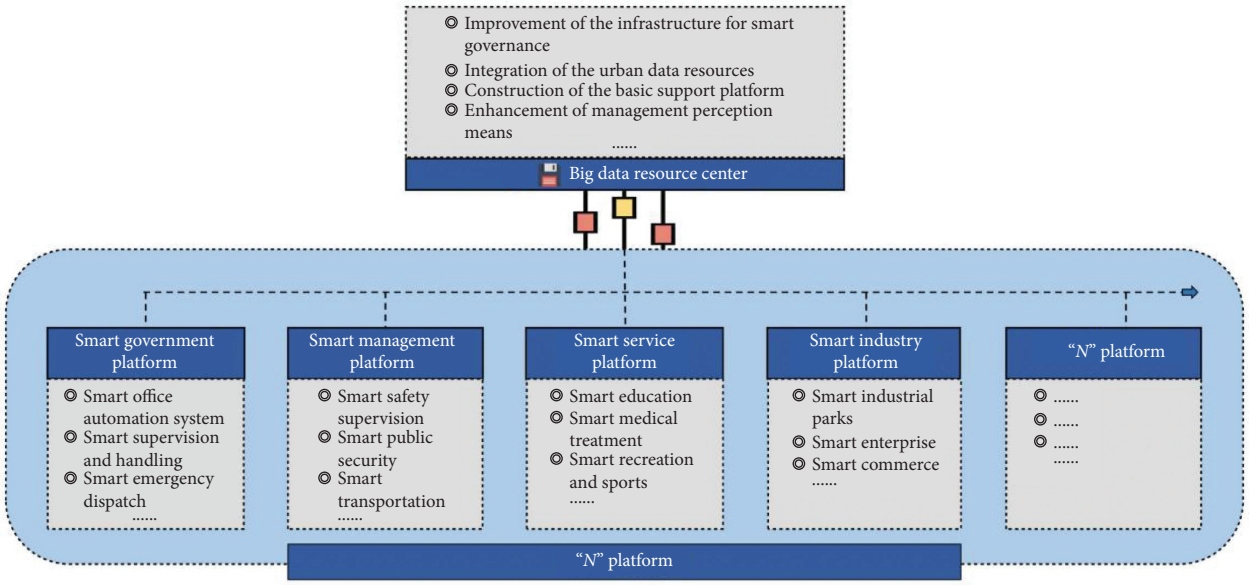

Figure 1: "1 + N" integrated smart information platform.

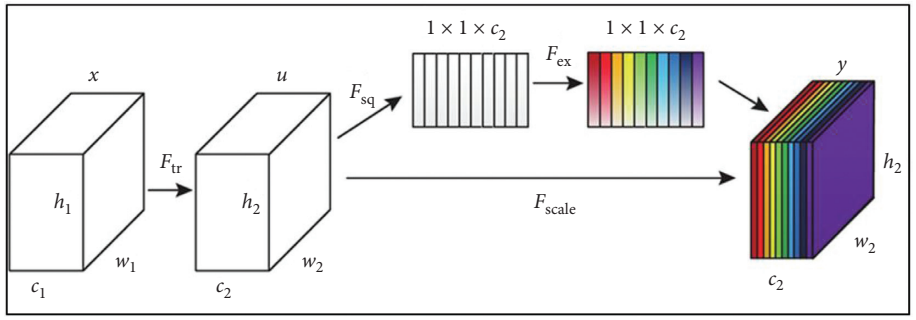

Figure 2: Algorithm iteration process in this platform.

information (such as vector group or matrix) that can be recognized by the computer through the feedback link in the automatic analysis process. Realize the adverse effect of output on input, and then achieve automatic high-precision classification based on feedback control. The network traffic prediction model based on the neural network algorithm, under normal circumstances, will automatically analyze and process the data classification that needs to be queried based on multiple feedback links. When we perform predictive analysis on the platform based on the more commonly used state probability formulas in neural network algorithms, the specific formulas are as follows:

$$P_j(T_k) = \frac{\sqrt[3]{K}C_k}{C_{k+1}}, \tag{1}$$

where P represents the prediction result and C represents the different types of data analysis. There is also the influence of data T_k in data eigenvalues on probability $P_i(T_k)$.

When the T_k is very large, the probability of each state is almost equal. At this time, the neural network algorithm began to perform wide-area search, and the $P_i(T_k)$ difference expanded as the course data predicted by the network traffic decreased.

$$E_i = \frac{K}{T_K}, \tag{2}$$

where E represents different dimensional data and K represents different data selection rules at this time:

$$\sigma_\theta(x) = \sum_{i=1}^{n} P_i(T_\theta). \tag{3}$$

The validity and error of the problems involved in this study are related to the set error confidence h, and the correlation with the initial solution is also relatively large. In order to only examine the numerical method itself, usually only the stability of the numerical method used to solve the model equation is tested. The model equation is given by

$$\begin{cases} y' = \lambda y, \\ y(a) = y_0. \end{cases} \tag{4}$$

Among them, λ is a complex number, this equation is also called the test equation, and its true solution is as follows:

$$y(x) = y_0 e^{\lambda(x-a)}. \tag{5}$$

When using the random probability model to solve different practical problems, the result is

$$(1 - h\lambda\beta_k)y_{n+k} = \sum_{i=0}^{k-1}(\alpha_i + h\lambda\beta_i)y_{n+i}. \quad (6)$$

Let the solution be

$$y_n = r^n. \quad (7)$$

Then, there is

$$(1 - h\lambda\beta_k)r^{n+k} = \sum_{i=0}^{k-1}(\alpha_i + h\lambda\beta_i)r^{n+i}. \quad (8)$$

Its equivalent form is given by

$$(1 - h\lambda\beta_k)r^k = \sum_{i=0}^{k-1}(\alpha_i + h\lambda\beta_i)r^i. \quad (9)$$

We call the above formula the feature confidence solution formula based on probability random variables and their numerical features. Remember

$$\pi(r; h\lambda) = (1 - h\lambda\beta_k)r^k - \sum_{i=0}^{k-1}(\alpha_i + h\lambda\beta_i)r^i. \quad (10)$$

And take the above formula as the limit characteristic error degree in solving the probability distribution model.

Therefore, when the optimal solution of the network traffic prediction system needs to be solved, the output image of the function when the parameter θ is 1 and 2 is shown in Figure 3 (using different ST functions for simulation), where the horizontal axis N represents different sizes in the dataset and the vertical axis T represents the accuracy calculation operator.

The platform includes N platforms, namely, all platforms for building smart government affairs platforms, such as the Smart Government Platform, the Smart Management Platform, the Smart Service Platform, and other platforms required by holistic governance. For example, (1) the Smart Government Platform takes handling documents, meetings, and affairs as the core, and it meets the needs of the Party and government for coordinating government affairs. Paperless office and mobile approval support and data visualization make decision-making more scientific. (2) Through the Smart Management Platform, the government adopts the combination of the Cell Grid Management Method and the Urban Component and Event Management Method and the tools of real-time information collection and transmission to reconstruct the urban management process in order to realize accurate, agile, efficient, and multidimensional urban management. (3) The Smart Service Platform, adhering to the concept of Internet + government services, aims to improve the level of social governance refinement and comprehensively promote networked and highly informationized public management and services from a higher starting point. This platform innovates the government management model, clarifies responsibilities, and integrates resources to achieve "zero distance in social services, full coverage in social governance, and prompt responses to residents" demands. It realizes the transformation of urban governance from prevention and control to humanized and service-oriented governance and from extensive governance to refined governance.

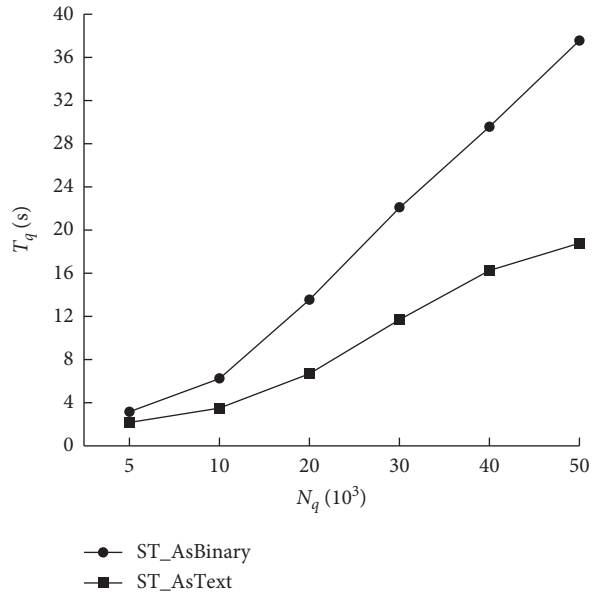

Figure 3: Function output image during simulation.

4.2. "Power-Sharing Linkage, One-Center and Dual-Track" Platform Construction Command System. As shown in Figure 4, power-sharing linkage refers to the distribution of jurisdiction according to the functions of different levels and departments. The smart governance system can automatically allocate and fully link public affairs notifications and governance data between different levels and functional departments within the scope of law. "One center" refers to the "Urban Smart Control Service Command Center," and "dual track" refers to two tracks. The first track is from the Municipal Government Command Center to the Municipal Departments Command Center to the District Departments Command Center to the Street Departments Command Center and finally to the Community Service Center, which serves as the control service command information channel in ordinary times. The other track is from the Municipal Government Command Center to the Street Command Center and finally to the Community Service Center, which is mainly used as an emergency joint command information channel and auxiliary information channel in ordinary times. Accordingly, a "one-center and dual-track" operation carrier with high efficiency is formed to ensure a city's control and command linkage. The vertical hierarchy and horizontal organizations are closely integrated and integrated through information technology [35].

5. Operation Logic of Urban Smart Governance Information Platform

5.1. Functional Module of Information Platform for Urban Smart Governance. Urban smart governance is the reform and innovation of traditional government governance under

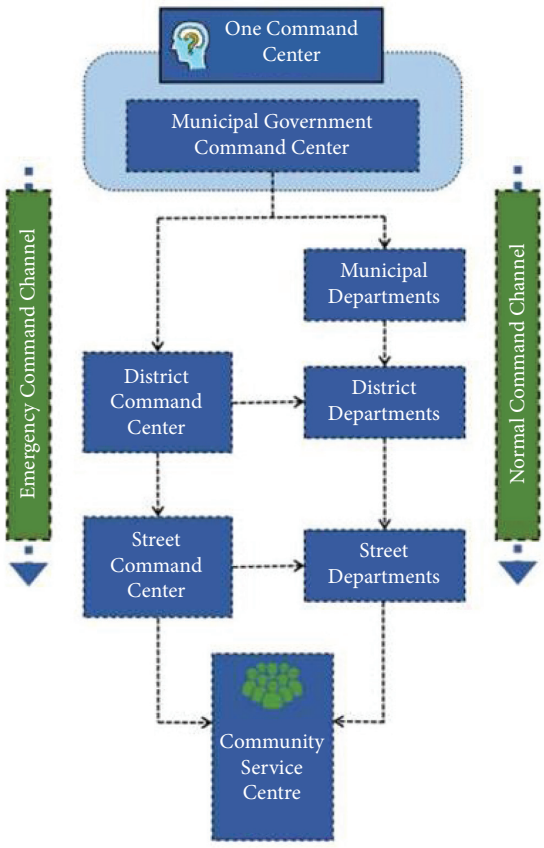

Figure 4: "Power-sharing linkage, one-center and dual-track" platform construction command system.

the framework of smart city construction. Gil-Garcia et al. [6] believed that with the help of modern information technology development, smart governance has made creative breakthroughs in government strategy and investment to make governance sustainable and flexible. On this basis, the Smart Information Platform of Urban Governance aims to bridge the islands of information formed by the decentralized storage and management of departments and to form a computer room, a server cluster, a network, and a data center to realize big data collection, access, integration, management, application, and release. Based on the data center, the smart information platform will command and coordinate administrative affairs and urban operation monitoring (Table 1).

5.2. Operational Logic of Urban Smart Governance Information Platform

5.2.1. Data Integration

(1) Data Integration. Driven by the rapid development of information technology, big data has been integrated into people's lives; it has not only profoundly changed the political-ecological environment of cities but also promoted the transformation of democratic politics from passive participation to active participation. Every governance body is the source of data, and fairness for actors is based on the deep integration of networks and data. In view of democracy, Decker [36] regarded big data as a "disruptive innovation." Democratization of data has been quietly taking place, and government construction will develop towards efficiency, innovation, and transparency.

As shown in Figure 5, the platform integrates urban infrastructure, resources, the environment, municipal management, and commerce into a holistic system through the analysis and sharing system and the application of intelligent delivery, communication, Internet, and data processing technology. In addition, it forms a data center through the Internet, cloud computing, data discovery and analysis, and other technical means and constructs subsystems, such as the urban population, transportation, energy, trade, telecommunications, and environmental resources, to perceive, transmit, process, and share data intelligently in the urban system. Urban governance can realize the real-time exchange of data from the system according to different permissions; this enables the quick coordination and arrangement of resources to make governance decisions that allow a harmonious and sustainable city and enable an effective response to unexpected urban security issues.

(2) Data Collection. Deutsch [37] explained that information communication is as important to the government as nerves are to the human body. The collection and processing of social information and data assist the government in making scientific and efficient decisions, and the exchange of information inside and outside the system promotes the sustainable operation of government work. Based on the current situation of China's urban governance transformation, it is recommended that two halls and two centers be adopted as the concrete means of smart governance. It will serve administrative examination and approval of items to achieve the objectives of one window of acceptance, interconnection, and information sharing and to carry out two goals (100% online declaration and 100% online approval). Similarly, the platform is used to reform the administrative system (Figure 6).

All-natural persons, legal persons, and other entities have unique identifiers. That is, legal persons and other organizations have a unified national ID code so that government affairs can be handled with one code, which is conducive to improving the management level of public administration, reducing transaction costs, and improving social work efficiency (Figure 7).

Paperless offices, electronic declarations, and approval are implemented in the process of providing administrative services. For example, when a legal person declares matters, government staff actively search and check the certification materials through the database of the government service exchange platform to avoid trouble for the applicant and to prevent the need for a large amount of paper-version materials and certificates, as shown in Figure 8. The further development of information technology and urban management models is expected to further expand the coverage and efficiency of online services. "More data and less public running" will no longer be a slogan but will be gradually realized in more fields in the future.

Table 1: The functional module of information platform for smart urban governance.

Data integration	Public affairs allocation processing	Urban operation monitoring
(i) Data acquisition (ii) Real-time data input (iii) Data integration and management (iv) Data applications and services	(i) Network management and unified distribution and disposal center (ii) Three steps: first time to find, first time to deal with, first time to solve (iii) Two separation: patrol separation and handling separation (iv) Five systems: comprehensive inspection, diversified participation, intelligent governance, scientific law enforcement, good credit construction	(i) Government affairs operation monitoring (ii) Urban safety operation monitoring (iii) Economic operation monitoring

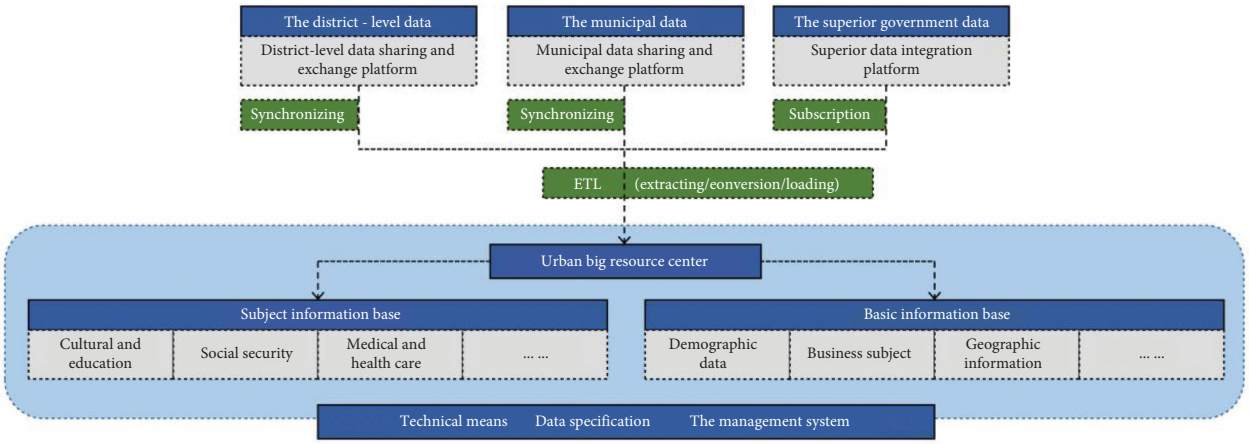

Figure 5: Data integration and application logic of the urban smart governance information platform.

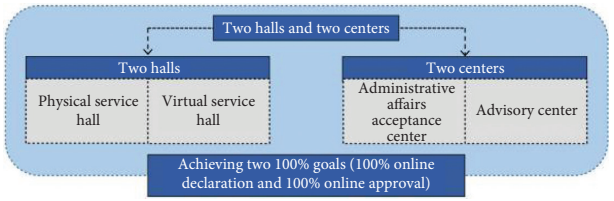

Figure 6: Transitional government management channels.

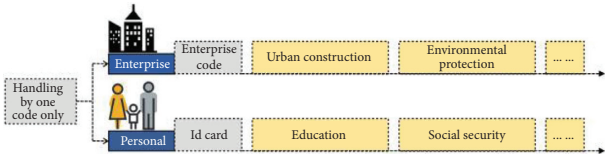

Figure 7: Handling by one code only.

5.2.2. Allocation Processing of Public Affairs

(1) Basic Framework of Distribution Processing Operation. Although unprecedented social changes have effectively promoted the progress of urban development, they have also created contradictions and challenges at the critical stage of city transitions. To solve different problems efficiently, unified scheduling and distribution processing are needed. The Smart Allocation Processing Platform, based on the principle of separation of inspection and treatment, uses GIS, remote sensing, apps, and other information technologies to realize smart governance for administrative affairs. As shown in Figure 9, the closed-loop processing

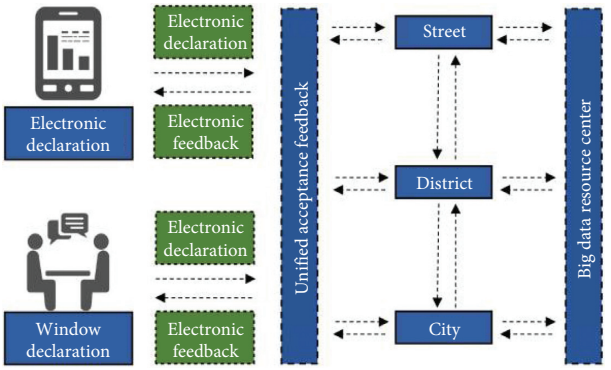

Figure 8: E-government service framework and operational logic.

mechanism of "event collection, allocation, disposal, verification, evaluation, and settlement" is formed to establish the information support capability for first-time discovery, first-time disposal, and first-time solutions for urban governance events to promote the refined and scientific development of social governance. The whole operation design combines service classification, spatial information service chain, workflow, and other technologies to ensure clear business logic and convenient operation of transaction processing according to a specific business logic.

(2) Support System for Allocation Processing Operation. Relying on the Smart Information Platform of Urban Governance, urban governance areas are divided into community cell grids according to certain standards to form grid governance. Through the inspection and monitoring of

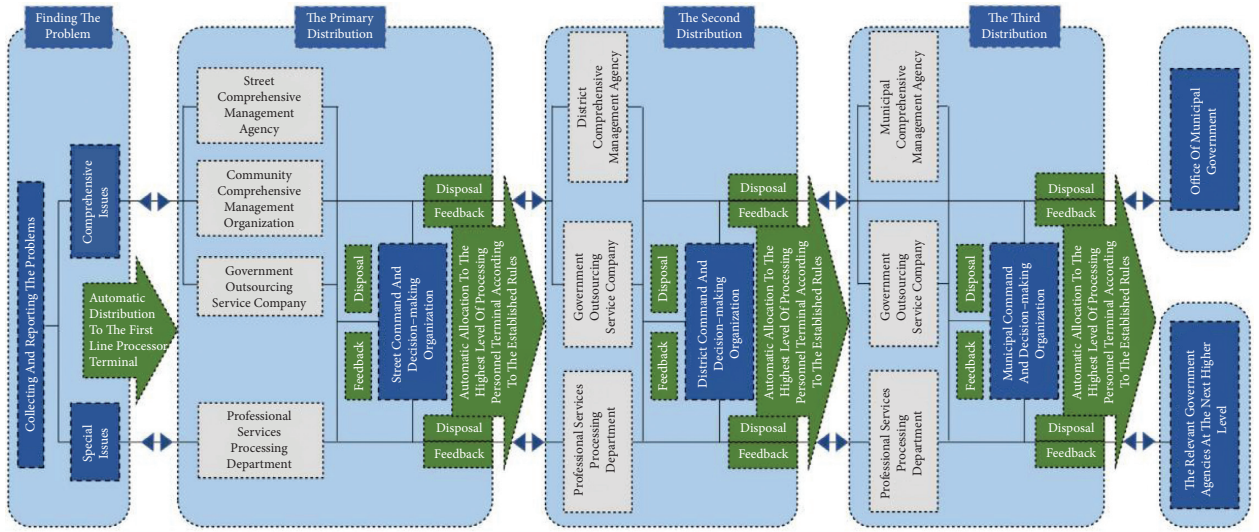

Figure 9: Smart distribution processing operational framework.

the community cell grid, unified scheduling, allocation, and disposal, the form of separation of supervision and disposal is established.

Comprehensive inspection forms a comprehensive and professional patrol team at the street level. Through a comprehensive patrol in which one person is in charge of one space and a professional patrol in which one person is responsible for a large patrol network, the whole coverage patrol is formed to identify problems for the first time. This can achieve the target of proactive discovery and timely treatment to improve governance efficiency and solve urban problems in the germination stage. Diversified participation means actively mobilizing the wide participation of society, such as NPC Members, Party Deputies, CPPCC Members, retired cadres, volunteers, and residents' representatives, to enrich the forces for large-scale inspection and renovation. Intelligent governance, the "brain" of urban governance, aims to strengthen the operation and application of digital management means such as data integration, operation monitoring, distribution processing, and collaborative command in the grid management system to integrate all relevant data on people, events, and objects into the system. In addition, it will strengthen commands with big data technology to achieve instantaneous distribution and real-time processing. Scientific law enforcement, forming strong synergy through self-inspection by enterprises, government supervision, and law enforcement investigations to focus on solving problems at the first line, will continue to improve and reform the law enforcement mechanism. Good credit construction, the foundation of management and control, will strengthen the data application of grid management and integrate the credit records of enterprises and individuals into a united credit database and achieve the first correlation in the application and approval of administrative matters. In this way, each responsible subject is forced to fulfill its own responsibilities (Figure 10).

5.2.3. Urban Operation Monitoring. Due to the influence of multiple factors of physical society and virtual society, cities in the information age are faced with increasingly complex unexpected events, and city operation and management are also facing great challenges. As governments attach increasing importance to data governance, they should consider how to change decentralized data management in various fields of emergency management into comprehensive data management using a unified structure, organization, and process. Accordingly, the management and service mechanism using data for decision-making, management, and services will be formed. Urban operation monitoring and early warning play an important role. The application of the Smart Information Platform of Urban Governance in urban operation monitoring will directly or indirectly affect the processes and results of emergency management. The concept of deep integration of technologies such as the Internet of Things, big data, cloud computing, and spatial geographic information technology with business domains of comprehensive emergency management has been accepted and recognized by many municipal governments and academics in China. As shown in Figure 11, City Operational Visualization is the exhibition of real-time situational awareness, collection, sharing, and information about multidimensional interagency collaboration for emergencies and responses to events. This will connect relevant departments, agencies, and command centers at all levels of the emergency response to realize the communication and sharing of real-time situation information in order to ensure joint responses and coordinated emergency responses and to

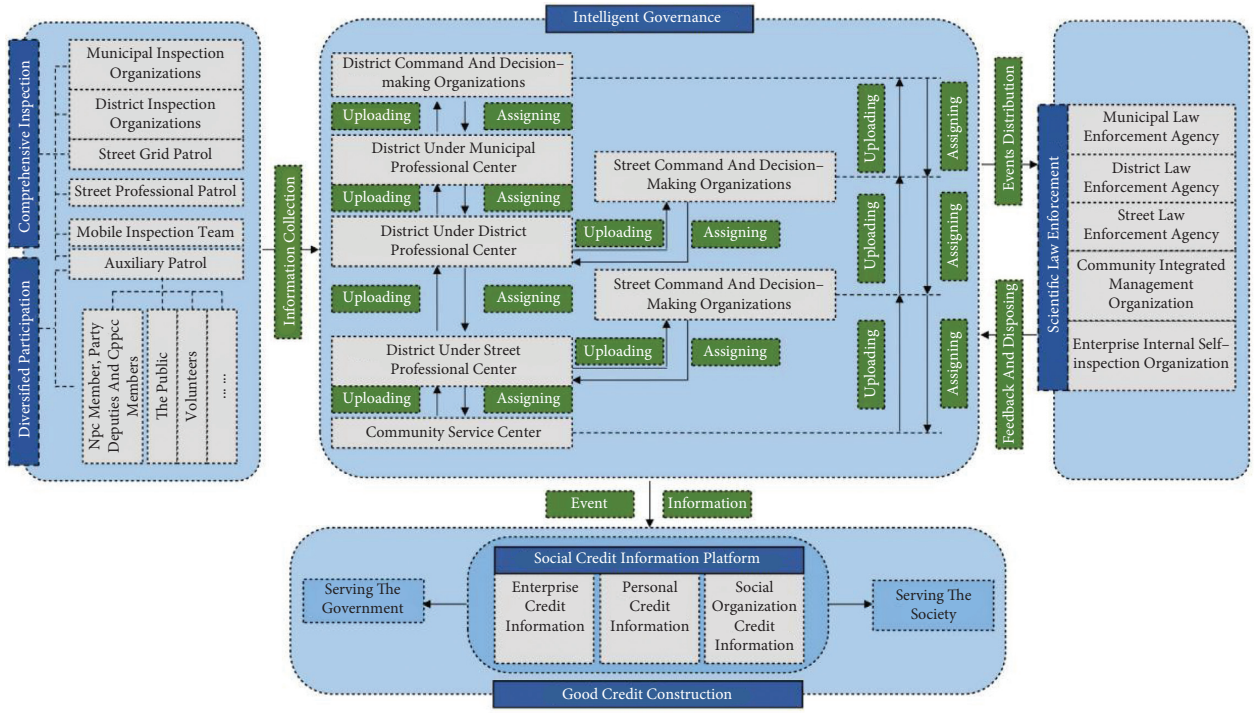

Figure 10: Smart distribution processing operational support system.

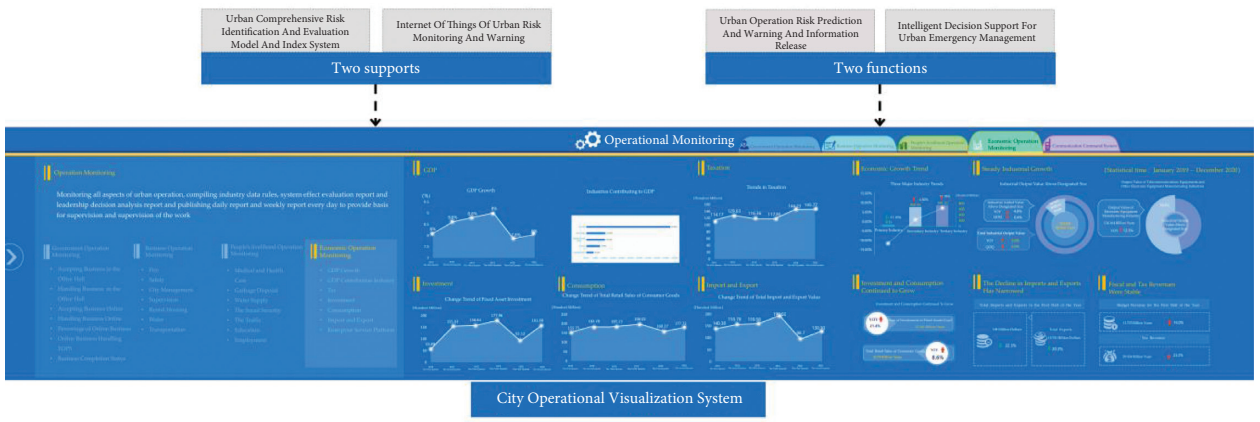

Figure 11: City Operational Visualization system.

realize the sharing of emergency resource information and visual command.

Two major supports are as follows:

Urban Comprehensive Risk Identification and Evaluation

The risk evaluation model and index system of government affairs, city safety, the economy, and other fields of operation will be established to realize the risk evaluation and analysis of a single field. Hence, machine learning and other technologies are used to continuously learn and train real-time data to realize the automatic optimization of risk analysis models and intelligent risk prediction. Finally, risk prevention and control measures will be generated automatically.

Internet of Things of Urban Risk Monitoring and Warning

The monitoring and early warning system covering all levels, services, and processes in urban governance through the Internet of Things will be constructed. The most significant goal is to strengthen the monitoring areas closely bound to people's lives, such as urban lifelines, traffic, the environment, flood prevention, and fire control and develop comprehensive application systems for monitoring urban operational signs, risks and hidden dangers, risk assessment,

prediction, and early warnings in order to provide application support for various subjects of urban governance.

Two functions are as follows:

Urban Operation Risk Prediction and Warning and Information Release

Artificial intelligence and other information technology are used to achieve higher government efficiency and the scientific analysis of disaster development trends, accident impacts and consequences, economic operations, and so on. First, the early-warning information from various departments will be integrated and strengthen the research and application of precise early-warning release technology to realize the targeted release of urban operation. Second, different responses to early warning persons and the public should be used, and innovation should be developed in the mechanism of early warning information release. The channel of early warning information release should be unblocked, and the effectiveness of early warning information transmission should be improved.

Intelligent Decision Support for Urban Emergency Management

According to the types and evolution trends of urban operation emergencies, this paper conducts in-depth mining and analysis of relevant data under multisource data fusion technology for event information and relevant cases to intelligently provide decision-making support for emergency event disposal.

5.3. Operational Performance Evaluation Mechanism. Evaluating the process and results of urban governance based on the Smart Information Platform for Urban Governance is important for promoting the modernization of urban governance in the new era. This platform can quickly process acquired data and realize the sharing and linkage of real-time data. It provides the possibility for relevant subjects of urban governance to supervise, evaluate, provide timely feedback, and adjust the content of urban governance. Moreover, the efficient, scientific, and credible modern system of urban governance must rely on the establishment of a performance evaluation mechanism.

On the one hand, the establishment of a sound performance evaluation mechanism can give full play to the external evaluation and supervision role of society and the public in urban governance to adjust governance decisions and to improve government credibility. At the same time, it can improve the sense of participation of social organizations and the public as the main body of urban governance and stimulate the enthusiasm of social organizations and the public [38].

On the other hand, a perfect performance evaluation mechanism can improve the scientific level of urban governance and guarantee the effectiveness of the platform. Due to the real-time and rapid characteristics of information means, policy feedback is timely and convenient for the timely adjustment of urban governance policies and means to make decision-making more scientific and accurate. At the same time, the serious consequences of decision-making mistakes need to be reduced or prevented.

Therefore, in the era of smart urban governance, it is necessary to build a scientific and perfect performance evaluation mechanism and to build a performance evaluation system during the construction of the Smart Information Platform for Urban Governance to ensure the smooth progress of modernization of urban governance and make urban governance more scientific, more refined, and smarter. Meanwhile, the data resources of various intelligent systems are integrated to analyze the occurrence characteristics, trends, and changes in events. Various kinds of data will be adopted to perform a comprehensive evaluation of the work efficiency of inspection and rectification, to supervise abnormal situations in specific event handling processes, and to provide reference data for the evaluation and evaluation of inspectors.

5.4. Experimental Results and Analysis. Table 2 and Figure 12 show the results of 6 sets of data during the work process of the platform's database under the network traffic prediction. According to Table 2 and Figures 12–15, the horizontal axis N represents different flow data lengths, and the vertical axis R represents the calculated complex rate.

We can know that in the 5 sets of data, due to the different processing speeds of different types of data, the method based on the combined model of machine learning and neural network is better in terms of accuracy. In terms of computational complexity, we propose an optimization algorithm based on neural network. The complexity of the traffic prediction system is lower, and the difficulty of condition tracking is also lower.

It can be seen from the results that the accuracy of the model proposed in this paper is 0.984, 0.966, 0.967, and 0.932 in terms of data analysis and information extraction. Compared with 0.875, the accuracy of this model can be greatly improved.

On the other hand, in the process of 5 sets of experiments, it can be found that with the different number of experiments, the error of the experiment also shows a regular change, that is, the more the number of experiments, the smaller the prediction error.

6. Research and Analysis

6.1. Suggestions on Application and Construction of Urban Intelligent Management Platform in China

6.1.1. Realizing Platform Building and Data Sharing from Top to Bottom. It is the integration of many data chains within the city that are really concerned about the data links between different departments. Therefore, the construction of the whole platform must be led by the city managers, from top to bottom to strengthen department cooperation, government enterprise cooperation, and government people interaction. Based on the connotation of urban operation and development and urban management, the complete logic chain from macrocontrol to microgovernance is sorted out, and various complex problems involved in urban

Table 2: 5 sets of experimental data results.

Enterprise	Data 1	Data 2	Predicting fit (%)
Enterprise 1	93	97	87.5
Enterprise 2	94	94	93.2
Enterprise 3	89	83	92.1
Enterprise 4	93	98	96.7
Enterprise 5	92	97	96.6

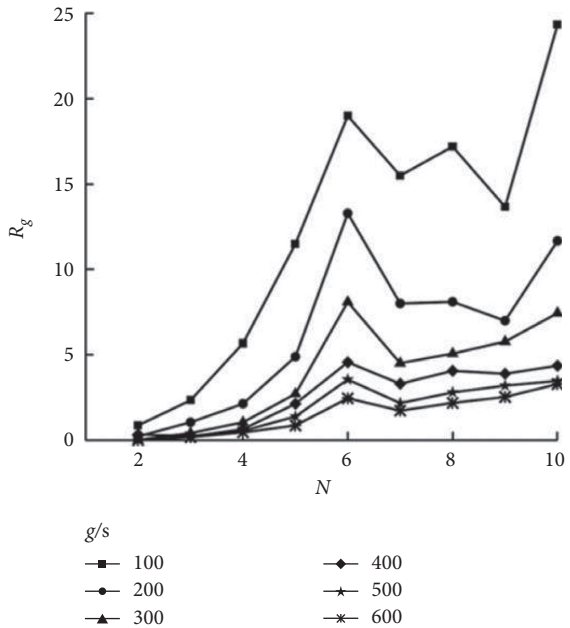

Figure 12: Image output of 5 sets of experimental data results *A*.

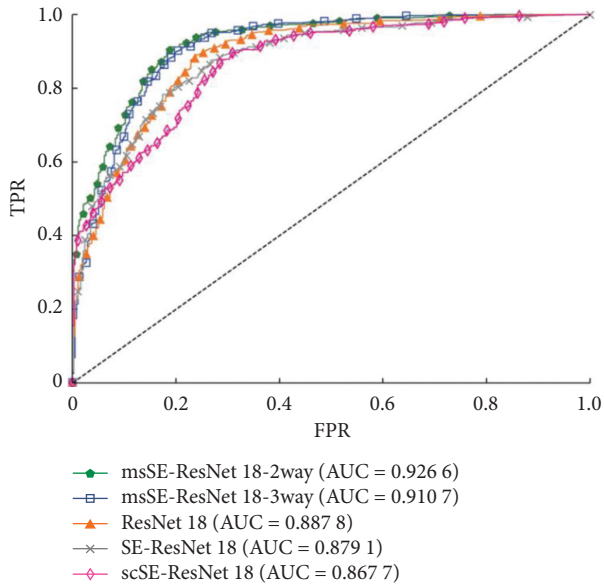

Figure 13: Image output of 5 sets of experimental data results *B*.

management are collected to realize intelligent perception and event response through the platform. The construction of the platform is the work of coconstruction and sharing of multidepartments and social institutions. On the basis of

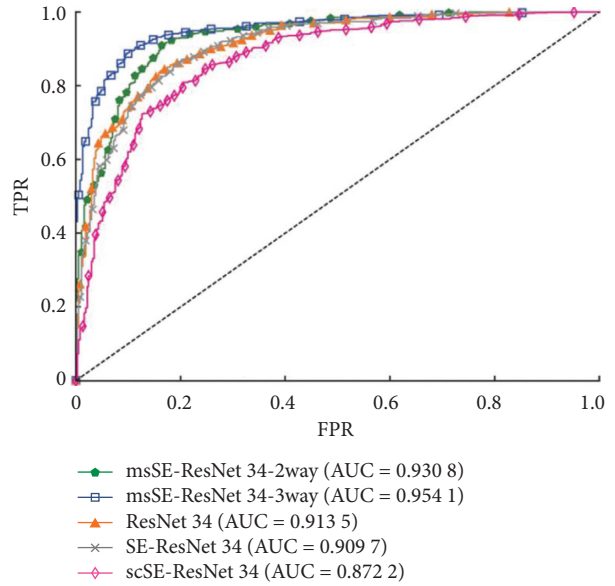

Figure 14: Image output of 5 sets of experimental data results *C*.

"data fusion," the decision-making of each department needs to comprehensively consider the data and work of relevant departments, and the multiobjective comprehensive decision-making across departments can be realized through data sharing.

6.1.2. Effectively Improving Data Quality through Data Governance. The value of data governance lies in standardizing information transmission between systems, improving data quality, and improving the level of data sharing and sharing between business and systems. Scientific data quality rules should be established, and data quality management should be run through all aspects of platform construction and use to meet the needs of business operation and management analysis. Meanwhile, data redundancy and infrastructure investment in storage, hardware, operation, and maintenance should be reduced to improve application system performance and reduce the burden of later maintenance. For some sensitive data, the data items should also be divided into specific sensitive levels, and according to this level, the data items can be properly protected in the whole life cycle, and the protection of residents' privacy data and key urban infrastructure should be strengthened.

6.1.3. Designing Scientific Urban Operation Monitoring Index System. The construction of urban operation monitoring index system should follow the principles of importance, guidance, and systematicness. The selection of indicators should be in line with the urban development strategy and social governance objectives and closely related to the scope of responsibility of urban managers; the construction of the index system must be based on the accurate understanding and linkage analysis of urban governance system, department business, social institutions, and related disciplines, so as to achieve effective coordination among

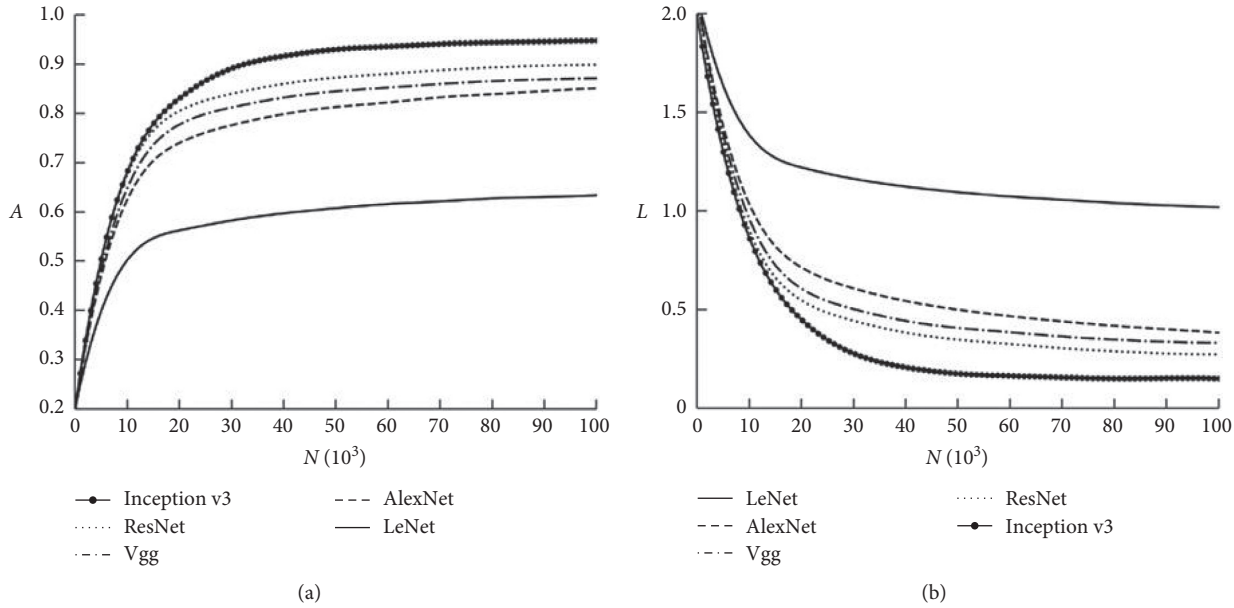

Figure 15: Image output of 5 sets of experimental data results *D*.

departments and minimize the negative effects and external costs of work.

6.1.4. Building Clear and Practical Application Scenarios. The application scenarios of urban intelligent management platform should be able to quickly show the city operation status and display the data change trend through the "one plug to the bottom" data granularity and space-time coordinates, so as to effectively support urban management decision-making. The real-time monitoring of abnormal points should be clear at a glance, and the analysis function should be provided according to the needs of users to help them accurately determine the causes of abnormal information. The simulation of urban development scenarios is also one of the government's key needs for platform capability. Supported by the complex background model, it simulates the development of the city and society, providing the basis for evaluation and decision-making. On the premise of meeting the content, the application scenario design should be clear and concise, the operation function should be simple and practical, and it can provide appropriate personalized customization according to the needs of users and can be used anytime and anywhere by portable devices.

6.2. Research Contribution. Technological change and innovation promote the full integration of ICT into the system of political power and urban governance. The superposition and combination of technological elements and other elements are a strong driving force of reform, which has become the catalyst for the development and progress of modern society in China. Wherever it goes, the original power structure system will be deeply changed and form a unique logic of technological governance and development. Specific technologies and specific governance goals and trends are closely linked to promote the mutual service and promotion of urban governance and information technology in a new and radical way [39]. In this paper, emerging Internet technology and urban governance are integrated for achieving smart urban governance, reengineering business processes, and transforming institutional advantages into governance efficiency.

6.2.1. Improving Social Equity and Social Order. The core concept of smart governance is people-oriented, and data-oriented instrumental rationality coexists with humanistic care. The transformation of urban governance from extensive management to precision governance will be promoted by this platform to improve the accurate supply capacity of various public services. Relying on big data acquisition and mining technologies, this platform can seize the demand characteristics of the public, enterprises, and other organizations and improve the matching, precision, and validity of governance to satisfy increasingly diversified and personalized demands and realize the public service of active response to the supply side. In no way does this paper propose conducting urban governance through methods other than science. The research of this paper is based on the existing social system, organizational structure, and urban problems. The famous scholar Hu [40] once pointed out sternly, "We do not deserve to reject science under the background of the chaotic altar monastery, underdeveloped communications, underdeveloped industry." There is no reason to reject science and technology in China in the present study and application, and even in urban governance, there should not be a one-sided emphasis on the human elements. Instead, we should construct the contemporary value order by means of technology, paying attention to the survival status of all social strata so that the

public can truly share the fruits of development and the problem of social equity can be solved.

6.2.2. Promoting Social Democracy and the Rule of Law. It is necessary to establish the operation rules of government data, rebuild the operation rules of government affairs, and reform government institutions and before applying the platform to meet the system and business process requirements of smart urban governance. In this way, the modern urban governance mechanism of adopting data to make decisions, manage public affairs, and innovate will be constructed to adapt to the demand of smart urban governance. Through the integration of business, technology, and data, the government will reshape the government process, organizational structure, functional positioning, and responsibilities, break down organizational and information barriers, and improve the government's governance capacity and public service quality [41]. The platform will work with the new system to promote the participation of all citizens in urban governance to objectively promote the application of democracy. The extensive participation of the public in governance can pool the wisdom of the public to the greatest extent in order to improve the scientific nature of urban governance and establish good governance in the actual urban governance practice that conforms to the fundamental interests of the public.

6.2.3. Building a Chinese Sample of City Governance. It is indispensable to improve the efficiency of urban governance in the information age by ICT. The application of the urban smart governance information platform will be conducive to improving the efficiency of government operations, promoting economic development, social governance, and cultural development, and enabling all of society to run like clockwork. The application of the platform, which conforms to the transformation trend of urban governance in China, will set a governance example for Chinese cities.

6.3. Discussion. The smart governance concept further promotes the city governance path of innovation. The urban smart governance information platform, an effective means of implementing intelligent management, will constantly improve the management network at the city, district, street, and community levels in practice to form a unified intelligent information platform for the governance of the whole city. Platform governance includes matters in various areas of urban social life and information on people, places, things, events, and organizations within the jurisdiction into the database management. The establishment of a long-term mechanism for data updating and the realization of dynamic monitoring and management should be established to discover and process problems in a timely manner; this enables effectively realizing the government's public management and services to social units. However, it needs to be emphasized that the formation of any urban order cannot be achieved without the participation of people. It is difficult for the government to form a flexible order by means of strong administrative regulation or wishful planning. Urban governance transformation must be built and operated under the guidance of a people-oriented concept, gathering diverse subjects and various social forces and jointly promoting the modernization of the urban governance capacity.

Data Availability

The raw/processed data required to reproduce these findings cannot be shared at this time as the data also form part of an ongoing study.

Conflicts of Interest

The authors declare no conflicts of interest.

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