Opportunities and Challenges of Grid Management Based on the Perspective of Science and Technology Support

Ying Zhou[1], Manfei Cui[1,*] and Yong Li[2]

[1]*College of Public Administration, Zhejiang University, Hangzhou City, 310058, China*
[2]*College of Marxism, Shanghai Maritime University, Shanghai, 201306, China*
*Corresponding author: 782651102@qq.com

ABSTRACT

From the perspective of science and technology assistance, this work studied the opportunities and challenges of grid management. First, this work further refined the concept of grid management theoretically. Second, it provided new ideas and solutions for the new problems and challenges in the current practice of social governance. Grid management is the innovation of social governance at the grass-roots level and the extension of social governance to the grass-roots level in China. Science and technology itself is the basis of grid management, which helps to solve the problem of insufficient manpower in grid governance and makes grid more "intelligent". However, grid management is also faced with challenges such as lack of top-level design, overall planning, and talent team construction, and the infringement of technology on community autonomy, which needs to be further improved.

Keywords: *Grid management, Opportunity, Challenge, Science and technology assistance*

1. INTRODUCTION

Social governance requirements in the new era make science and technology increasingly become the basic force and important means. The report of the fourth plenary session of the 19th CPC Central Committee points out that in terms of improving the prevention and control system of public security, it is necessary to "improve the three-dimensional, legalization, professional and intelligent level of public security", which all highlight the importance of the development of science and technology development in social governance in the new era. Grid management is an important practical innovation of grass-roots social governance since the third plenary session of the 18th CPC Central Committee. The establishment of grid governance system plays a positive role in optimizing grass-roots public service and management, deepening the construction of peace and rule of law, and promoting the modernization of grass-roots governance.

"Science and technology+grid" is helpful to the coordination, precision and intelligence of social governance, and can improve the efficiency of social governance significantly. Especially since December 2019, the novel coronavirus pneumonia has been infected and spread all over China [1]. "Science and technology+grid" has realized the precision of epidemic prevention and control, which is the trend of social public governance in the future under the digital economy era. Although the development of information technology such as the Internet of things, block chain, big data, and artificial intelligence has brought new opportunities for grid management, it has also put forward new challenges. How to grasp the opportunities and respond to the challenges and problems of governance in the new era is the key content of this study.

2. LITERATURE REVIEW: SCIENCE AND TECHNOLOGY, AND GRID MANAGEMENT

2.1. Grid management

Grid refers to the management area with a clear boundary and appropriate size according to the standard division. Gridding refers to the grass-roots social governance system based on the administrative division of "grid" and supported by information. Grid management is to set up or approve the establishment of specialized agencies by the people's government in accordance with the unified working standards, and to appoint grid service staff to inspect the components and events in the responsibility grid. The identified problems are transmitted to the disposal department through a specific grid management system, and the disposal situation is monitored and implemented in a reliable mode of operation. Grid management is rich in content. In terms of the participation main body, the party, government, social organizations, and residents can participate in the grid

management process; in terms of the service object, party building, comprehensive management, policies and regulations publicity, social security, emergency management, convenience services, conflict and dispute resolution, production safety, health, environmental protection supervision, fire safety and other areas can be found through multi-channel inspection components, and event problems are grid management service objects. The grid staff mainly perform the basic functions of information collection, social sentiment and public opinion collection, safety hidden trouble investigation, conflict and dispute investigation and resolution, and legal policy propaganda, and assist in the development of rental housing management, floating population registration, fire safety management, and safety production management, which has played a basic role in social governance.

In China, the practical operation of grid management precedes theoretical research and first begins in Beijing and Shanghai. In 2004, Dongcheng District of Beijing applied grid management in the field of social governance and innovated the mode of social governance, which has attracted academic attention to grid management. It seems to show a "no grid, no governance" development trend [2]. Zheng et al. [3] believe that grid management refers to the modern management thought of using computer grid management to divide the management object into several grid units according to certain standards, and making use of modern information technology and the coordination mechanism among grid units to effectively exchange information and share organizational resources transparently, so as to integrate organizational resources. Improve management efficiency. Chen Yun [4] believes that grid management refers to the means of effectively allocating various resources and providing transparent overall services for resource demanders, so as to improve management efficiency. Yang Hongshan and Pieding Jun [5] think that gridding is a kind of management mode that divides urban and rural community jurisdiction area into several grid units and implements dynamic, all-round and fine management for each grid.

2.2. Technology facilitates grid management

The development of science and technology has spawned a new generation of information technology represented by 5G, Internet of things, block chain, big data, and artificial intelligence, and further promoted the profound transformation of social governance. The fourth plenary session of the 19th CPC Central Committee decided to take science and technology support as an important part of the "social governance system", and put forward "perfecting the social governance system supported by party committee leadership, government responsibility, democratic consultation, social coordination, public participation, legal protection and science and technology".

The Internet of things refers to the Internet connected with things, which connects objects to the Internet with a series of sensing technologies and communication means [6].

With the rapid development of the new generation of 5G communication technology, the Internet of Things will greatly improve the efficiency of government's public services (such as home-based care) and the ability of social governance (such as security and fire protection).

Block chain is a new application mode of computer technology such as data storage, point-to-point transmission, and encryption algorithm. At present, the national block chain technology commercial competition has gradually entered the climax. The application of block chain technology in government budget, customs supervision, entry and exit records, voting campaigns, public welfare activities, real estate transactions, welfare payments, pension exchange, logistics management, medical benefits and other aspects have started. How to maintain public order, provide effective services, achieve social inclusion, and support innovation and entrepreneurship are common difficulties in the implementation of social governance at present. In addition to scientific system design, strong technical support is also needed to cope with these challenges [7].

Big data is the product of information development to a certain stage. With the deep integration of information technology and human production and life, and the rapid popularization of the Internet, the global data presents the characteristics of explosive growth and mass agglomeration, which has posed a great impact on economic development, social progress, national governance and people's life. At present, China's social governance is changing from the traditional government-centered unitary governance system to the government-led coordinated governance model of other social organizations. Big data not only serves as a technical means but also as a social paradigm, providing an unprecedented opportunity for the transformation and innovation of China's social governance [8].

Artificial intelligence is the machine intelligence created by human beings, which is the extension and simulation of human theory, method and technology. Artificial intelligence will be written into the *Government Work Report* in 2017. In the future, artificial intelligence will become an important goal and direction of the development of various fields in China. With the help of artificial intelligence technology, the way of social governance is reformed, the service level of social governance is promoted, and the efficiency of social governance is improved.

Science and technology can perfect the comprehensive management system of urban operation, strengthen the efficiency of social governance, optimize the management mechanism of urban operation, deepen the integration of big data of social governance and intelligent upgrade of command and dispatch platform, re-engine the fine and efficient process of urban operation "appeal corresponding, citizen participation, data sharing, daily monitoring, emergency command", accelerate the construction of urban operation system covering public management, public safety and public service, build data-driven "intelligent city", and further enhance urban governance ability.

2.3. Overview

Although the practical exploration and academic research of grid management have already been carried out, there is no consensus on the relevant definitions. In this work, the gridding is defined as a community-based approach, which divides the community into several grid units according to certain principles, and uses certain scientific and technological means to finally realize refined management. Taking big data as an example, the key word "big data + grid management" was searched on CNKI, and it was found that only one article was published in 2012, and the number of articles reached 38 in 2020. "Science and technology + grid management" has attracted more and more scholars' attention, which is also the trend of social public governance in the era of digital economy. From the perspective of science and technology, this work combed the opportunities and challenges faced by gridding, which can not only further refine the concept of grid management in theory, but also help to provide new ideas and solutions for the new problems and challenges encountered in the current social governance practice.

3. OPPORTUNITIES FOR GRID MANAGEMENT BROUGHT BY SCIENCE AND TECHNOLOGY

Scientific and technological means have shown good results in grid management, representing the future development direction of scientific, refined and intelligent governance of urban and rural communities. Science and technology is not only the foundation of gridding, but also helps to solve the problem of insufficient manpower in grid governance. Science and technology make the grid more "intelligent".

3.1. Science and technology is the basis of gridding

Du Jiao (2020) thinks that although the concrete practice and emphasis of grid management system construction are different in different places, the overall thinking and internal logic are highly consistent. In general, the construction of grid management system mainly includes grid cell division, grid management team construction and network information system construction.

Network information system needs a variety of data and system support: first, basic data system refers to the information system running data, including basic geospatial data, network data, component data, and business data; second, basic geospatial spatial data refers to basic topographic data and remote sensing image data that provide unified spatial position reference for grid division, component acquisition and problem location; third, grid data refers to the collection of cell grid data and responsible grid data. Through recording and processing component data, the component data should be uniquely coded; fourth, operational data refers to the data of discovery, acceptance, dispatch, disposal, verification, case settlement, evaluation and other links, including basic data of person, place, matter, object, situation and organization, service data and active service data; fifth, based on the grid governance system and supported by modern information technology, the grid city operation intelligent scheduling system integrates various data resources such as basic geographic space, network and components based on computer software and hardware and network environment, so as to realize the grid governance related management components, management events and services of the dynamic, intelligent supervision, scheduling, disposal, statistics, analysis and decision-making and other functions of computer integrated application system.

3.2. Science and technology help solve the problem of manpower shortage in grid governance

Taking the prevention and control of the epidemic as an example, on February 16, Wuhan imposed a strict community blockade. However, a strict community blockade requires the mobilization of staff, and the community organizations themselves cannot undertake such a difficult task. Taking a town in Beijing as an example, the township has 10 communities, the number of households ranges from 1000 to 4000, with each community organization staffed by fewer than 20 people, and the number varies from 11 to 19. Outside Beijing, the problem is even more acute [10]. Therefore, relying solely on manpower to govern community work is insufficient. Big data, artificial intelligence, cloud computing and other digital technologies can be used to provide scientific and technological support in epidemic analysis, virus tracing, prevention and treatment, resource allocation and other aspects. "science and technology + gridding" can strengthen the existing governance. In fact, during the epidemic prevention and control phase, the largest amount of work is blanket investigation. In particular, the flow of reworkers increases the pressure of information registration. Technology companies have successively launched scientific and technological measures to help the epidemic prevention and control, such as the Epidemic APP developed by Zhejiang Government in cooperation with Alibaba.

3.3. Technology makes the grid more "intelligent"

General Secretary Xi Jinping pointed out in March 2020 that "the only way to promote the modernization of urban governance system and capacity is to make cities smarter and more intelligent from digitalization to intelligentization". This argument indicates that science and technology is the development direction of grid

management, and the government can promote effective coordination between governance bodies and achieve accurate and efficient community governance through extensive use of digital technology.

Science and technology enables grid management to implement in Jiaxing City, and Jiaxing relies on the information system of social governance integrated command work to construct "grid connection and group service" integrated command platform, so as to accelerate the interconnection with the public service business system of all departments (units), and realize the collection of grid service management information at one time and multi-party sharing. Promoting the further use of AI technology, real-time intelligent summary and analysis on the data information, the group may cause contradiction, cause information security problems, and affect social stability, which can contribute to multiple factors analysis. Studying and judging the information with the value of early warning and prediction can provide the decision-making basis for making targeted policies and carrying out special rectification.

4. CHALLENGES OF GRID MANAGEMENT UNDER THE HELP OF SCIENCE AND TECHNOLOGY

With the increasing maturity of science and technology and the development of grid management in grass-roots governance, "science and technology + grid management" has significantly improved the efficiency of grass-roots governance. At the same time, it is necessary to admit that China is still facing new challenges in the "science and technology + grid management":

4.1. Lack of top-level design and overall planning

Technology can't replace governance, which needs top-level design and overall planning. Although the government in China has the largest amount of data, the vast majority of the government's operational data are raw statistical data rather than the data that has been managed, cultivated and analyzed. At present, the structural data formats of various government departments are different, and the conversion between them is very cumbersome [11]. First, it is necessary to carry out data integration and data analysis. Second, it is necessary to support and guide the development of related technologies and industries for a long period, strengthen standardization work, organize and compile white papers on big data, artificial intelligence, block chain, Internet of things, and guide the society to increase investment in key areas.

4.2. Lack of talent team building

The vast majority of grass-roots staff is only familiar with the work of their department, and only masters the professional knowledge and experience in a certain field. In particular, some community workers have limited scientific and cultural quality. Some of them know nothing about big data, while others know little about it. Few professionals truly understand and master the vision and operation ability of big data [12]. The struggle for development, in the final analysis, is the struggle for talents. Therefore, it is necessary to improve the multi-level training mechanism for scientific and technological talents of social development, help enterprises to strengthen talent training, encourage universities to develop key disciplines, and gather scientists and high-end talent research and development teams.

4.3. Potential infringement of community autonomy attributes by science and technology

The means of technical governance have profoundly changed the basic nature of village governance and may make its "autonomy" attribute be stripped away. Residential (village) level governance develops toward the direction of administrative development; residential (village) self-government began to appear alienation. By means of modern information technology, the technical tools of government intervention in village affairs realize the direct presence of the government. Its essence is the extension of the government bureaucratic layer system to the village [13], and the development of science and technology may cause the infringement of the attribute of community autonomy. Therefore, it is necessary to pay attention to the autonomy attribute of villages and communities, and guard against the promotion and application of technology so as to prevent the consequences of dispelling villagers' autonomy [13].

5. CONCLUSION

When science and technology prospers, the nation will prosper; when science and technology are strong, the country will become strong. The management of "science and technology + gridding" is the important experience of gridding and advantage of grass-roots governance in China. At the same time, "science and technology + gridding" also faces the problems of lack of top-level design and overall planning, lack of talent team building, and the potential infringement of technology on the community autonomy attribute. Therefore, it is necessary to carry out data integration, strengthen standardization work, organize and compile relevant technical white papers, and guide the society to increase investment around key areas. At the same time, it is necessary to perfect the multi-level social development science and

technology talent training mechanism, help enterprises increase the strength of talent training, encourage colleges and universities to carry out key discipline construction, and bring together scientists and research and development teams. Finally, it is necessary to pay attention to the autonomy of villages and communities, and guard against the promotion and application of technology so as to prevent the consequences of dispelling villagers' autonomy.

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