

Digital Platforms and the Reshaping of Urban Governance: The Evolution and Controversies of Algorithmic Governance Research

Yilin Liu^{1, *}, Shukun Yang²

¹ School of Marxism, Capital Normal University, Beijing 100000, China

² Institute of International Studies, Shanghai University of International Business and Economics, Shanghai 201600, People's Republic of China

*Corresponding author: 1236903017@cnu.edu.cn

Abstract

Algorithms, digital technologies, and the platform economy are tightly interconnected, which significantly changes everything. This paper, based on the premise of algorithmic governance, conducts a literature review and develops a three-part logical-analytical framework for the relationship between technology, platforms, and urban governance to analyze the reforms of the city governance due to platform intervention. Studies indicate that algorithms are more than just a tool characteristic but also a governance power with allocation of resources and shaping of rules. This embedding is a dynamic process of co-shaping between technology and institutions. The digital platforms, taking advantage of their strength in data and algorithms, have turned into quasi-governance organizations that engage in the sphere of public life and disrupt the old dichotomy of public and private power, creating a new tripartite of power. Simultaneously, they become part of the multidimensional innovation in urban governance in organization, authority, responsibility and space which creates a technical governance model based on the participation of platforms in the governance led by the Party and government. Moreover, the algorithmic governance is at a significant risk including the black box of algorithms, monopoly on data and online exclusion, which are predisposed to failure of regulation, over-empowerment of platforms, and social division.

Key words

Algorithmic governance; Platform economy; Urban governance; Quasi-governance entities; Integrated technical governance

1. Introduction

The emergence of new generation information technologies including big data, artificial intelligence, cloud computing and mobile internet has seen a fast adoption of digital technology in all the spheres of social life and urban control that has never been witnessed before. What were once the earliest information-based management tools have now become indispensable components of governance systems. Digital technology does not merely alter the manner in which the government obtains, processes and uses the information, but it significantly transforms the methods of providing the public services, distributing the social resources, and the urban operation mechanisms. In particular, against the context of building smart cities and the further development of the Digital China strategy, the urban governance model is experiencing a fundamental shift towards the administration of a collaborative governance of the technology-platform-system. Digital technology is not merely an auxiliary resource to enhance the effectiveness of governance, but is increasingly becoming a powerful driver of governance structure reforms, process optimization, and governance relationship restructuring [1,2].

The role of algorithms in the creation of the platform economy has been seen as a significant area of technical support that links data, platforms and governance practices. Algorithms constantly meddle and influence social mechanisms by means of data gathering, information filtering, behavioral forecasting, and distribution of resources. In the context of urban governance, algorithms do not just perform information processing and decision support tasks but are increasingly assuming the tasks of behavior guidance, rule formulation and governance coordination. As an instance, in the fields of traffic dispatch, food delivery, shared mobility, and community governance, algorithms have become a significant driving force in shaping individual conduct and social stability [3]. Therefore, due to the control over the data resources and the benefits of the algorithmic technologies, the platform enterprises slowly establish new kinds of platform power unrelated to the conventional administrative and market powers and build a new power system in the platform public sphere where administrative power - platform power - private rights interrelate[4].

Nevertheless, along with the high pace of the

platform economy and algorithmic governance, there have been numerous new risks and challenges. Black boxes of algorithms result in a lack of transparency of decisions, data monopolies enhance the concentration of platform power, algorithmic bias can create an imbalance in the allocation of resources, and personal privacy and data security remain topics of social concern[5]. The question of how to strike a balance between government regulation, platform autonomy, and public participation when platform power goes beyond traditional governance limits in some domains is one of the major questions in the practice of digital governance. Hence, further investigation of what role platforms play in urban governance, how they affect the functioning of the power, and how they can reorganize the social order by using algorithms not only adds value to theoretical studies of algorithmic and platform governance but also contributes significantly to the development of modernized urban governance and construction of a more just, efficient and sustainable digital governance system.

2. Platform Economy Intervention and Multidimensional Reconstruction Mechanisms of Urban Governance Systems

Before examining the specific reconstruction mechanisms, it is necessary to clarify three interrelated yet distinct concepts that recur throughout this paper: algorithmic governance, platform governance, and digital governance. Although often used interchangeably in popular discourse, they denote different analytical layers. Digital governance is the broadest category, referring to the overall application of digital technologies (including big data, AI, cloud computing, and the Internet of Things) to public administration and policy-making. It encompasses both technical infrastructure and institutional reforms aimed at improving efficiency, transparency, and participation. Platform governance is a narrower subset, focusing specifically on the role of digital platforms—private or hybrid organisations that mediate between users, service providers, and governments—as governance actors. It addresses the platform's internal rule-making, data management, and external interactions with state and societal stakeholders, as well as the emerging power relations between platform

enterprises and traditional public authorities. Algorithmic governance is the most specific layer, denoting the use of algorithms (i.e., rule-based or machine-learning models) to automate or semi-automate decision-making, resource allocation, behavioural guidance, and risk assessment in governance processes. While algorithmic governance is often implemented through platforms, it can also occur within government-operated systems without platform intermediation. Conversely, platforms exercise governance not only through algorithms but also through contractual terms, reputation systems, and market design. Thus, these three concepts form a nested hierarchy: algorithmic governance is a key operational mechanism within platform governance, which in turn is a distinctive modality of digital governance. Failing to distinguish them risks conflating technical tools with organisational forms and policy frameworks. In this paper, we adopt this tripartite distinction to analyse how platform-embedded algorithms reconfigure urban governance, while acknowledging that in practice these layers overlap and co-evolve. This conceptual clarification lays the groundwork for the subsequent discussion of power centralisation, responsibility networking, and capability integration.

Centralized integration of power dimensions is one of the main characteristics of modern governance. One Network Unified Management is the integration of the data resources and processing facilities that are spread out among the departments and levels into a single digital system, which can lead to the full aggregation of information on the work of the city and the correct centralization of command and dispatch rights. This process is also reflected in the creation of hub-type digital governance platforms, which is a concentrated manifestation of it [6].

The networked expansion of responsibility dimensions is a hallmark of modern multi-stakeholder governance. Electronic technology has changed the distribution of urban governance functions at the hierarchical level into grid nodes creating a comprehensive responsibility network. The one-net unified management system has it such that upon detection of an urban governance issue, the system will automatically allocate responsibility to the responsible entity in the corresponding grid based on the nature of the incident and spatial location and starts time-based monitoring and assessment systems.

The integrated empowerment of the capability level is one of the fundamental pillars of the successful multi-actor governance. The restructuring of the powers and responsibilities has not only to do with redistribution of power and responsibility, but it also has to do with the general enhancement of the capacity to govern. According to the study conducted by Tian Xianhong, when algorithms are incorporated into grassroots governance, they will increase perception, decision-making, and mobilization capabilities of the government based on the mechanism of information empowerment allowing grassroots units to be able to have the same capabilities when performing downward governance functions. Within the paradigm of the so-called "one-network unified management", the grassroots grid workers may use the city operation management platform with their mobile terminals, getting the data query rights that were before restricted to the specialized departments, smart evaluation help and cross-departmental coordination assistance. Such integrated capability destroys the dilemma in grassroots governance of having power at the top, responsibility at the bottom, and inadequate capability, and brings about a leapfrog transfer of governance capacity between higher and lower levels using digital channels.

The process of building urban governance systems with the support of digital intelligence requires the analysis of data integration because it helps eliminate the information barriers between departments. The hierarchical collaboration mechanisms provide clarity in governance responsibilities at various levels, whereas closed-loop implementation allows tracking and accountability of all governance tasks in the whole chain, starting with the detection and going to the handling and feedback. All three together create an enclosed institutional loop within the framework of the "One Network Unified Management" system, which has centralized power, networked responsibility, and unified capabilities, representing a radical shift away from the concept of fragmented divided governance toward holistic governance.

3. The Institutional Tension and Practical Dilemmas of Algorithmic Governance Embed-

ded in Urban Governance

3.1 "Algorithmic Black Box" and the Risk of Regulatory Failure in Urban Public Governance

Although embedding algorithms in city governance enhances efficiency, it initiates an acute dilemma at the regulatory stage as well: the decision-making process and resource distribution are increasingly being based on algorithms by administrators, but the operational principles of those algorithms are not understood by such administrators or the population at large—this so-called black box of algorithms presents serious dangers of failure in the oversight of urban government governance [3].

In terms of technical nature, black-boxes of algorithms can be attributed to three interrelated factors. First, popular machine learning models, particularly the deep neural networks, are unexplainable even the designers have problems explaining why a given model has made a particular decision. Second, commercial systems do not provide information about the working principles of the central algorithms on the basis of trade secrets, which leads to a failure in technical control by external regulators. Third, even with published algorithm codes, normal people and even most of the government officials do not have the technical literacy to comprehend how they work. This combination of these three elements has brought up a perilous tendency in the propagation of algorithmic decision-making in urban governance—a disconnect between the use of power and the responsibility of power.

The algorithmic black box is not merely a technical-transparency deficit; it is also a critical amplifier of digital exclusion. When decision-making rationales are opaque, biases embedded in training data, model specifications, or feature selections become nearly impossible to detect and correct through routine oversight. This opacity directly translates into distributional consequences: algorithms that score neighborhoods, assess creditworthiness, or prioritize service delivery operate without external scrutability, meaning that disadvantaged groups—often already underrepresented in data—can be systematically misclassified or overlooked without any

clear avenue for appeal. Moreover, regulatory failure, as discussed above, leaves these algorithmic distortions unchecked, allowing them to harden into enduring patterns of spatial stigmatization and resource deprivation. In other words, the black box does not merely obscure how decisions are made; it actively shields the very mechanisms that produce unequal outcomes, thereby transforming technical uncertainty into social and spatial injustice. The following section examines precisely how such shielded algorithmic operations reorganize urban social space, creating new forms of group differentiation and exclusion that are both less visible and more resistant to challenge than conventional discriminatory practices.

3.2 Digital Exclusion and Spatial and Group Differentiation in Urban Society

Although algorithmic governance enhances the efficiency of city operations, it also establishes new forms of exclusion and differentiation in urban social space by means of digital screening, automatic sorting, and selective distribution of services. While such digital exclusion is less visible than physical violence, it reorganizes the stratified nature and spatial organization of the urban community in a more hidden and long-lasting manner.

In terms of space, algorithmic governance adds new screening devices in the creation of social spaces. According to Dan Yong, the algorithm marks and shapes certain areas as high-risk areas based on its crime risk scores which separate and digitize them, and this has implications on the allocation of public safety resources and social value[7]. Intelligent governance also has spatial consequences, which Chen Peng divulged: the digital technology-based spatial governance may seem objective and accurate, but it has the potential to reproduce or even enhance the existing spatial inequalities[8]. If an algorithm tags a neighborhood as having a high crime risk or a low credit rating, then more surveillance is provided, public services are reduced, and business investments are shifted, all of which result in a vicious cycle of spatial devaluation. This form of algorithmic spatial stigma is much more refined and clandestine compared to the traditional spatial labeling since it relies upon the discourse power of information objectivity and hence, is more challenging to challenge and reverse.

4. Limitations of Existing Research

4.1 Lack of a Systematic Integrated Perspective of "Algorithms—Platforms—Urban Governance"

One of the most significant constraints of available studies is the fact that the algorithms, platforms, and the urban governance are frequently studied in the context of their respective independent studies, but they do not have an integrated approach that can link these three. The study of algorithm governance deals with the power impacts and regulatory mechanisms of the technical level, and the research of platform governance is devoted to business models and social responsibility, while the study of the digital transformation of urban governance is mainly related to the government debate about institutional construction and practical innovation. The three groups are extremely disconnected and there is a strong trend of fragmented studies in this overlapping subject.

Absence of holistic approaches will not just restrict the explanatory capabilities of scholarly research but they will also be detrimental to the systematicity of policy responses. Fragmentation of the governance practice would be inevitable when technology, organization and institutions are studied separately. Other researchers argue that the disconnection between technology and governance objectives and the high level of data isolation between departments could even increase fragmented governance[6]. It also confirms the practical expense of missing an integrated perspective—the introduction of algorithmic technology cannot automatically make overall governance more effective, but can add new fragments due to the inertia of fragmented systems. Hence, the formation of an analytical framework that would incorporate algorithmic power, platform logic, and urban governance structures into a single process of interpretation is not only a theoretical necessity to solve problems of real life, but also an academic task to facilitate the interdisciplinary integration.

4.2 Insufficient Attention to the Consequences of Algorithmic Power in Spatial

Dimensions

If the algorithms use risk or credit ratings to evaluate particular urban regions, such objective data labels could be turned into continuous deterioration of space more surveillance, fewer services, reduced readiness to invest, eventually creating a vicious loop of self-perpetuating spatial injustice. Simultaneously, the spatial effects of intelligent governance: Despite the fact that digital technology-based spatial governance boasts of its objectivity and precision, it has the potential to reproduce or even increase the pre-existing spatial inequalities[7, 8]. Nevertheless, studies that combine the concepts of algorithmic power, platform economy, and urban spatial governance in one integrated analysis are very rare.

The causes of such absence can be complex. To start with, studies on spatial governance have historically been dominated by physical spatial planning and digital technologies have been considered as a technical aspect of smart city development rather than exploring the inner workings of technology and how it implicitly creates space. Secondly, there exists an academic legacy in algorithmic governance research that is more inclined to law and sociology and does not engage deeply in the study of urban geography and spatial planning. Third, the effects of algorithms in the spatial sense are very obscured so that they cannot be easily observed in a short-cycled research design, which to a certain extent restricts the development of empirical studies in this sphere. This gap needs to be filled by future research innovating methodologically, integrating both capabilities of acquiring and analyzing spatial data and theoretical understanding of the mechanisms of algorithmic governance revealing spatial principles of the algorithmic power operations[9, 10].

5. Conclusion

This paper uses algorithmic governance as the central analytical lens, situating it within the actual context of the platform economy's significant role in urban governance. This is done systematically to arrange the power logic, organization mechanisms and institutional dilemmas in digital platform engagement in urban governance and develop an integrated analytical framework of technology-platform-urban governance. Through the

review and synthesis of the pertinent literature and theoretical perspectives, this paper shows that there is an ever-increasing connection between algorithmic technologies, platform organizations and urban governance and it explores the ways of transformation and the challenges that are confronting the models of urban governance in the context of the platform economy. The present chapter will summarize the results of the research and make additional suggestions about the main areas of the future research in order to offer some references to the development of the theory of urban governance and optimization of governance practice in the digital era.

The study results show that the governance transformation caused by the deep integration of digital technology in the urban operational systems is not simply a technological advancement or modernization of governance instruments, but rather, a restructuring process encompassing power configurations, organizational structures, and institutional frameworks. Due to the emergence of big data, artificial intelligence and mobile internet technologies, algorithms are slowly moving out of the background as technical solutions and are becoming significant players in the decision-making on resource allocation, behavioral control and regulation. Algorithms have not only increased the rate at which information is processed and the level of accuracy in urban governance but, to a certain extent, they are changing the structure of relationships and distribution of power among actors involved in urban governance.

The internal logic behind this change can be described as three linked aspects: the power of algorithms, platform identity, and the reconstruction of governance. Firstly, algorithms depend on large amounts of data and smart computing capacity to develop new forms of governance that affect society by means of information filtering, risk assessment, and decision making assistance, and ultimately develop algorithmic power that has some real power. Secondly, digital platforms, using their status as intermediaries between governments, markets, and society, are slowly moving beyond the conventional single market functions of businesses, assuming multiple roles as business actors, rule makers, and consumers of government services. The combination of both public and private organizations causes platforms to become significant players in the urban governance system. Lastly, the combination of algorithmic power and platform

organization has led to the gradual change in the traditional government dominated governance model to a multi-stakeholder collaboration governance model, and the urban governance structure, the method of allocating resources and the mechanism of the provision of public services have all taken on new development features.

Similarly, studies indicate that the engagement of the platform economy in urban management is also not entirely beneficial. The phenomenon of black boxes in algorithms, data monopolies, privacy threats, and the rise of platform power have been a constant source of new problems related to fair governance, transparency, and interest protection of people. What strategies are there to balance between improving the efficiency of governance, ensuring the preservation of the value of the population, and what measures need to be taken to create regulation systems and institutional structures that would be in line with digital governance, has become a pressing question to be answered in the future modernization of urban governance. Thus, constant emphasis on the limits of operation of the algorithmic power, accountability systems of platform governance, and the ways of optimizing multi-stakeholder collaborative governance model will be the key priorities of the future research development.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

References

- [1] Cohens, A., & Padison, R. (2000). New challenges in urban governance. *Urban Studies*, 37(5-6), 845-850.
- [2] Dacruz, N. F., Rod, P., & McQuarrey, M. (2019). New urban governance: A review of current themes and future priorities. *Journal of Urban Affairs*, 41(1), 1-19.
- [3] Shen, F. (2026). Algorithmism: Technological dependence and theoretical perspectives in digital society. *Party and Government Research*, (1), 86-97.
- [4] Anon. (2023). Theoretical reconstruction of the public nature of digital platforms and its practical development. *Comparative Law Research*, (6).
- [5] Zhou, T., & Yang, F. (2026). Research on the construction path of intelligent empowerment for urban smart and efficient governance systems. *Information and Communication Technology and Policy*.

- [6] Meng, Z., et al. (2023). How can local government digital governance effectively improve grassroots governance effectiveness? A case study based on the 'One-Network Unified Management' in Area A, S City. *China Administrative Management*.
- [7] Dan, Y. (2024). Crime risk scoring and spatial governance in the digital society. *Legal Studies*, 46(3), 189-206.
- [8] Chen, P. (2025). Reconstruction of the spatial logic of smart city governance: Mechanisms and limits. *Urban Planning*, 49(8), 73-81.
- [9] National Development and Reform Commission, National Data Administration, et al. (2025). Further development plan of smart cities and promotion of digital transformation in all domains action plan [Z].
- [10] Acs, Z. J., Song, A. K., Szerb, L., et al. (2021). The evolution of the global digital platform economy: 1971–2021. *Small Business Economics*, 57(4), 1629-1659.