Analysis on Structural Pathways for Digital Transformation in Grassroots Governance

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Abstract. At present, the widespread application of digital technology in grassroots governance has not effectively improved governance efficiency as expected, but has exposed structural contradictions such as imbalance of power and responsibility, resource fragmentation, and information blockage. From a structural perspective, this paper points out that the core challenge of digital transformation is not the technology itself, but its incompatibility with the existing governance structure. This paper proposes that digital technology shall be used as a tool to promote structural optimization, and the coordinated adjustment of the governance system shall be achieved through information integration, clear definition of power and responsibility, process re-engineering, and resource coordination. Meanwhile, it is also necessary to establish supporting institutional guarantees to promote digitalization from surface operations to deep embedding. This paper aims to provide structural improvement ideas for the digitalization in grassroots governance and facilitate realizing the governance modernization.

Keywords: Grassroots governance; Digital transformation; Structural Dilemma; Structural Value; Structural Reconstruction.

1. Introduction

With the deepening of the modernization of the national governance system and governance capacity, the widespread application of digital technology in grassroots governance has become an irreversible trend. Various types of “Digital Platforms” and “Smart Governance Systems” are being rapidly rolled out, and reforms such as “One-stop Service” for government services and “One-stop Integration” of grassroots affairs are being continuously advanced. However, in practice, this technology-driven governance transformation has not significantly improved the grassroots governance dilemma as expected. Instead, it has presented phenomena such as “Hot at the Top and Cold at the Bottom”, “Exhausted to Cope with”, and “Technical Countermeasures”, and even new governance problems such as “Digital Formalism” and “Burdens worsened by Digital Tools”[1]. These problems remind us that the real obstacles encountered by digital transformation may not be due to the limitations of technology itself, but are more deeply rooted in the structural contradictions in the governance system.

Existing research on the digital transformation in grassroots governance focuses on technical effectiveness, platform construction or governance model changes[2][3][4]. Although it has achieved relatively rich experience summary and theoretical refinement, it is still weak in explaining the structural roots of poor digitalization and transformation obstruction. Especially in the face of complex governance reality, technical rationality is often distorted by organizational structure logic in the embedding process. The digital platform originally intended to empower the grassroots may become a new burden carrier. This "Technical Rationality-Structural Imbalance" tension phenomenon is increasingly becoming the core bottleneck in the promotion of digital transformation.

This paper intends to re-examine the logical premise and practical dilemma of the digital transformation in grassroots governance from a structural perspective. The so-called "Structural" mainly refers to the institutional arrangements such as the allocation of power and responsibilities, resource coordination, information flow, subject coordination, incentives and constraints among various elements in the governance system[5]. When digital technology is embedded in the existing governance system in a platform-based, data-based, and intelligent manner, these structural relationships are not only unreconstructed, but are further made explicit and tense due to the "Amplification Effect" of technology. Therefore, the key to whether digital transformation can truly

improve governance capabilities lies not in what technology can do, but in whether the institutional structure can accommodate and stimulate its potential.

On this basis, this paper will focus on the following core issues for analysis: First, why are the structural contradictions in grassroots governance more prominent in the context of digitalization? Second, does digital technology have inherent potential in structural adjustment, and what is its "Structural Value"? Third, how can we achieve effective coupling between digital transformation and governance modernization through structural adjustment? This paper attempts to construct an analytical framework centered on "Structural Optimization", emphasizing that digitalization is not a tool to replace the system, but a technical lever to leverage structural change. In theory, this paper attempts to respond to the current problem of "Emphasis on Instrumental Rationality and Insufficient Structural Analysis" in current digital governance research, and expand the structural pathways of research on digitalization in grassroots governance. In practice, we hope to provide policy recommendations with structural adaptation logic for the digital transformation in grassroots governance, and help technology empowerment move from "Surface Access" to "Deep Embedding".

2. Structural Dilemmas and Digital Tensions in Grassroots Governance

Although the digital transformation is widely regarded as an important engine for promoting the modernization in grassroots governance, it frequently encounters the dilemmas of "Inefficient Advancement" and "Reverse Load" in practice[6]. The key to this phenomenon is not the defects of digital technology itself, but the series of structural tensions triggered by its embedding into the grassroots governance system. In other words, the effectiveness of technical tools depends on the institutional structure to which they are attached, and the inherent structural contradictions in grassroots governance are further amplified in the context of digitalization.

2.1. Inherent contradictions in governance structure

Grassroots governance is not a balanced and stable system, but rather a complex arrangement shaped by multiple, often conflicting institutional logics. This complexity gives rise to several structural contradictions that hinder effective functioning.

One major issue lies in the misalignment between power and responsibility. Within the hierarchical governance framework, grassroots organizations function at the "End of Execution," yet they are burdened with increasingly extensive duties. Often, these entities operate in a state of "Accountability without Power" or "More Responsibilities but Less Power." Institutional features such as a "Highly Fragmented and Segmentary System" and the tendency to "Shift the Blame to the Superior and Inferior" further deepen this imbalance. Although digital platforms enhance command transmission efficiency, they fall short in alleviating the mounting pressure on grassroots operations.

Another structural contradiction emerges from the fragmentation of resources. Whether in terms of personnel, funding, or information, grassroots units have long struggled with dispersed allocation and poor coordination. Institutional silos remain prevalent, making systemic integration difficult. Even when unified platforms are developed, the lack of authority over resource scheduling often leads to a state of "Platform without Content."

Information flow is also obstructed. Delays, attenuation, and distortion frequently characterize vertical communication, while horizontal sharing is constrained by issues such as "Data Ownership" and "System Closure." Grassroots cadres, in turn, are inundated with repetitive and mechanical data-related tasks like "Filling, Uploading, and Repeated Entry," leading to widespread "Data Fatigue."

The structure of governance subjects introduces further complexity. Grassroots governance typically involves a mix of governmental (bureaucratic), community-based (autonomous), and market-oriented (platform) actors, each guided by its own logic. Coordinating among these diverse entities presents significant challenges. In the absence of supportive institutional design, digital platforms risk reinforcing a singular administrative approach, thereby limiting the participatory space of other actors.

A final point of tension stems from distorted incentive mechanisms. In a pressure-driven governance environment, performance assessments are often reduced to formalistic and instrumental exercises. This dynamic gives rise to issues such as “Digital Achievements” and “Selective Execution” [7]. While digital tools increase the measurability of outcomes, they also heighten the risk of governance practices that prioritize metrics over substance, including tendencies toward “Focus on Figures Only” and “Data Falsification.”

These structural issues are not novel; however, with the rapid integration of digital technologies, their “Amplifier” effect has made these contradictions more explicit and systematically entrenched.

2.2. “Structural amplification effect” of digital technology

In essence, the embedding of digital technology is not a neutral process, but a force for institutional reconstruction. It changes the operating logic of the existing governance structure by improving information penetration, strengthening process rigidity, and connecting multiple actors. However, this process does not automatically lead to optimization in practice; rather, it often gives rise to new tensions across several dimensions.

One significant shift is observed in the intensification of bureaucratic control. The implementation of digital assessment and online monitoring tools has significantly enhanced the “visibility” and “controllability” of administrative systems over grassroots affairs. While governance penetration improves as a result, these tools have also increased the extent of “technical control” exerted by higher-level authorities, thereby reducing the flexibility of grassroots entities in managing their own digital operations.

In addition, disparities in information access and digital capability have become more pronounced. Differences in technical literacy, system operation skills, and data comprehension between grassroots cadres and residents have contributed to a growing “digital divide.” The standardized logic embedded in digital platforms often overlooks the diversity and complexity of local realities, giving rise to outcomes where "a grandiose launch doesn’t necessarily lead to a great success."

Organizational integration also faces persistent barriers. Although platform-based governance aspires to cross-level and cross-departmental coordination, the deeply entrenched “highly fragmented and segmentary system” continues to obstruct such efforts. Platforms frequently encounter operational blockages — both horizontal and vertical — thereby exposing and exacerbating longstanding issues of interdepartmental disconnection.

Meanwhile, the relational dynamics among governance subjects are being reconfigured. The introduction of digital platforms alters how governments interact with communities and residents, often making the relationship more indirect due to platform-based “mediation.” Without adequate institutional design and support, such transformations risk falling short of true empowerment or meaningful coordination.

Taken together, these developments demonstrate that digitalization has not inherently resolved existing structural contradictions. In the absence of adaptive mechanisms to accompany technological deployment, digital transformation risks falling into a governance paradox characterized by “technology-driven pressure,” formalism, and even “power involution.” Addressing these challenges requires a fundamental shift in approach—from prioritizing technology itself to focusing on structural realignment, with a clear commitment to resolving the underlying institutional problems.

3. Structural Value of Digital Transformation and Logic of Governance Fit

Although the digital transformation of grassroots governance has encountered multiple constraints of structural tensions in practice, if digital technology is regarded as an institutional tool, its potential in structural reconstruction is still worthy of attention. Digitalization is not just an iteration of governance means, but may become a key lever for reshaping governance structure and activating institutional potential. To achieve this transformation, the key is to break away from the limitations

of "Instrumental Rationality" and re-understand the deep value of digital transformation from the perspective of structural adaptation and institutional fit.

3.1. Structural potential of digital technology

The core characteristics of digitalization—platformization, dataization, and intelligence—not only enhance the efficiency of administrative operations but also open up new possibilities for restructuring governance frameworks. This structural potential manifests in several key dimensions.

To begin with, digital technology significantly enhances information penetration and sharing capabilities. It strengthens the real-time collection, vertical transmission, and horizontal exchange of data, thereby mitigating "hierarchical attenuation" and breaking down entrenched "departmental barriers" in traditional information flows. By building unified databases and standardized interface systems, grassroots governance is better positioned to achieve cross-departmental data integration and real-time coordination, laying the groundwork for more effective collaborative governance[8].

Moreover, the emphasis on process re-engineering and rule solidification is central to digital governance. Standardized procedures and rule-based systems foster the alignment of administrative processes across both horizontal and vertical dimensions. Embedded logic within digital platforms helps institutionalize "procedural legitimacy," addressing longstanding issues such as unclear responsibilities and fragmented workflows in conventional governance structures.

In addition, digitalization facilitates the visualization and precise allocation of resources. Through the real-time display and demand-based matching of resource data, digital platforms enhance both the scientific basis and fairness of decision-making processes. This is particularly valuable in areas such as public service delivery and emergency response, where algorithm-driven scheduling models can improve efficiency and mitigate the pressure arising from fragmented resource distribution.

Equally important is the enhanced interaction among multiple governance actors. Digital platforms serve as accessible, high-frequency interaction spaces connecting governments, communities, social organizations, and residents. By transcending traditional organizational boundaries, these platforms promote the logic of "online co-governance," offering structural channels for multi-actor participation and establishing a technological foundation for more adaptive and collaborative mechanisms.

3.2. Structural fit between digitalization and governance modernization

At a higher level, digital transformation aligns closely with the goals of grassroots governance modernization. The latter calls for a comprehensive institutional system, efficient operations, coordinated mechanisms, and precise service delivery—all of which correspond to the structural capacities brought about by digitalization.

A key aspect of this alignment lies in the emphasis on structural clarity. Modern governance requires clearly defined power-responsibility boundaries and standardized administrative procedures. Digital platforms contribute to this by streamlining organizational frameworks and operational logics. Tools such as responsibility lists and workflow re-engineering enhance the transparency and predictability of institutional functions.

Equally important is the focus on operational efficiency and service precision. Through digital means, governments can more accurately identify service targets, define service content, and map delivery paths. This enables a more effective integration of supply-demand matching with problem-oriented approaches, helping to overcome the inefficiencies and "pan-administration" tendencies often observed in traditional bureaucratic systems.

Another dimension of compatibility is evident in the facilitation of multi-actor coordination. Contemporary governance increasingly faces diverse and complex demands, rendering single-centered, government-dominated models insufficient. Digital platforms act as structural connectors that allow different institutional logics—bureaucratic, autonomous, and market-based—to engage, interact, and collaborate to a meaningful degree.

Furthermore, digitalization functions as a catalyst for structural reform. By design, digital technologies possess the capacity to disrupt established patterns and enable the reconfiguration of

governance processes. When embedded within a well-designed policy framework, digital tools serve as anti-inertia mechanisms that foster departmental integration, resource coordination, and collaborative governance—ultimately driving the modernization of governance structures.

In sum, digitalization should not be regarded as a mere external addition to governance modernization. Rather, it represents an embedded structural force that, when properly aligned with institutional frameworks, has the potential to serve as a powerful driver for transforming governance into a more modern, adaptive, and effective system.

4. Digital Path and Operational Strategy for Structural Optimization

As mentioned above, the success or failure of digital transformation does not lie in the technology itself, but in whether it can be effectively embedded in the governance structure. The reason why digital transformation frequently encounters resistance is fundamentally due to the lack of structural adjustment mechanism, which leads to the "Reverse Discipline" of technology by structural contradictions. Therefore, if we want to truly unleash the governance potential of digitalization, we must jump out of the "Tool-oriented" thinking and turn to the transformation strategy design with structural optimization as the core. This requires not only that the digital platform has functional adaptation at the operational level, but also that it is embedded in the governance system and becomes the institutional fulcrum for structural reconstruction.

4.1. Three basic principles of structural adjustment

To achieve digital transformation with structural optimization, it is necessary to adhere to three complementary principles. These principles provide directional guidance for the specific design of structural paths and help avoid the trend of formalism or technological hegemony in technology governance.

To begin with, the principle of problem orientation and structure first highlights that technology cannot precede problem identification and structural diagnosis. It must respond to actual structural imbalances and find digital entry points through the sorting out of governance mechanisms, in order to avoid issues such as “technical idleness” or “platform stacking.”

In addition, the principle of collaborative symbiosis and logical integration emphasizes that digitalization should not strengthen a single bureaucratic logic. Instead, it should coordinate the operating mechanisms of government, community, social organizations, and market actors within platform design, aiming for the integration of multiple institutional logics.

Lastly, the principle of resilience adaptation and process reconstruction suggests that digital structural reconstruction needs to accommodate grassroots diversity and real complexity, while maintaining overall governance stability. This enables a flexible and empowering approach to process re-engineering.

4.2. Digital reconstruction path of key structures

Focusing on the core structural elements in grassroots governance, this paper proposes six digital adaptation paths, which correspond to the main structural bottlenecks in current governance.

Path 1: Reshaping of information structure. It can promote the construction of a unified data base and standard interface to achieve information sharing and platform interconnection among departments. By standardizing the scope of data collection and feedback mechanisms, redundant reporting and duplication of indicators can be reduced, and the information burden at the grassroots level can be reduced. At the same time, blockchain and other technologies can be used to improve the traceability and credibility of data flow.

Path 2: Adjustment of power and responsibility structure. With the help of digital platforms, “Listing of Responsibilities” and “Standardization of Tasks” can be promoted to make vague power and responsibilities concrete and visualized. Meanwhile, it is required to explore the “Digital

Authorization" mechanism, and grant grassroots units decision-making power and operating space within a certain scope of affairs through platform rules to enhance governance autonomy.

Path 3: Re-engineering of process structure. It is required to break the vertical and horizontal barriers of "Highly Fragmented and Segmentary System", integrate cross-departmental business processes in the platform, and form a "Matter-oriented" logical closed loop. For example, it is required to promote the "All-in-One-Go" reform, reconstruct the task flow path in the digital space, and realize the transformation from "Upward & Downward Communication" to "Multi-dimensional Collaboration".

Path 4: Integration of resource structure. Through data visualization and intelligent scheduling, unified coordination and on-demand allocation of human, material, financial and other resources can be achieved. The platform can combine real-time demand warning and resource distribution maps to optimize the public service supply structure and alleviate the inefficient allocation problem caused by resource fragmentation.

Path 5: Subject structure coordination. It is required to build a governance platform open to multi-subjects, and embed collaborative entrances for community organizations, residents' representatives, and corporate institutions. Through digital consultation tools, online discussion spaces and intelligent feedback systems, we will build a "Co-construction, Co-governance and Sharing" mechanism to improve the responsiveness and inclusiveness of the governance system.

Path 6: Optimization of assessment structure. Based on big data and intelligent analysis models, it is required to build a more comprehensive, real-time and non-intrusive performance evaluation system. The platform shall avoid "Focus on Figures Only", emphasize process quality and problem orientation, and prevent the indicatorization of technical assessments, the continuation of a pressure-type system, and the tendency towards "Digital Achievements".

The above paths together constitute a systematic transformation blueprint with structural reconstruction as the goal and digital technology as the focus. Each path not only responds to structural issues, but also realizes the technological embedding of transformation logic through platform mechanisms.

4.3. Supporting guarantee mechanism for structural reform

In the process of promoting digital structural adjustment, corresponding institutional guarantee mechanisms are also required to ensure that technological reform moves from "Point Innovation" to "System Leap".

To start with, ensuring the alignment between system and rules is essential. It is required to clarify data ownership, authority boundaries, and platform usage specifications to prevent issues such as "data out-of-control" or "platform generalization." It is also necessary to formulate and implement unified standards to promote compatible docking among various systems.

Another important aspect is capacity system building. It is required to improve the digital literacy of cadres and the information governance capabilities of grassroots organizations, and to promote the two-way integration of "technicians must understand governance" and "governance officers must understand technology," thus avoiding system idling and platform dependence.

In addition, advancing reform through gradual pathways is critical. It is required to avoid a "one-size-fits-all approach" and large-scale platform replication. Instead, a phased reform mechanism of "pilot – summary – promotion" should be encouraged to accumulate experience and correct deviations in practice.

These institutional supporting facilities are not "Auxiliary Links" of digital transformation, but key factors that determine whether structural reconstruction can be truly implemented. Only by achieving the coupling and embedding of technology, structure and system can digital transformation break through the path dependence of instrumental rationality and move towards deep-level governance reform.

5. Conclusion

The digital transformation of grassroots governance is a complex and profound systemic reform project, whose success depends not only on the advancement of technology but, more critically, on the degree of structural compatibility between technology and governance systems. This paper, from a structural perspective, reveals the structural tensions present in current digital transformation efforts. It points out that the "amplifier effect" of digital technologies has not mitigated existing contradictions; on the contrary, in some contexts, it has exacerbated issues such as imbalanced power-responsibility relations, fragmented resources, information blockages, and coordination failures. Therefore, grassroots digital governance must abandon the instrumentalist mindset of "technology as the solution" and shift toward an institutionally driven path focused on "structural optimization." The paper proposes six structural reconstruction pathways and three supporting safeguard mechanisms, aiming to build a transformation framework centered on structural adjustment, enabled by technology, and supported by institutional arrangements.

Looking ahead, to advance grassroots digital governance from “usable” to “effective,” and from “pilot trials” to “systemic leap,” the following aspects must be emphasized in practice: first, enhancing systematic identification and dynamic diagnosis of structural problems to ensure that technological applications address genuine governance pain points; second, promoting flexible alignment between top-level institutional design and the diverse needs at the grassroots level, avoiding one-size-fits-all platform replication; third, embedding digital technologies into institutions and operational processes to ensure a shift in governance logic from "people adapting to tasks" to "tasks aligning with institutional rules"; and fourth, constructing a synergistic mechanism that integrates technology, organizations, and institutions to foster a sustainable digital governance ecosystem. Only in this way can digitalization truly become a lever for structural transformation, driving grassroots governance toward a new stage of modernization, intelligence, and collaboration.

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