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# Localizing the digital: implementation frictions and digital governance in inland China

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## ABSTRACT

This article examines the localization of digital governance technologies in inland China, with a focus on Guizhou Province, which houses China's first big data pilot zone. Despite the centralization efforts of the Xi Jinping administration, local agents are pivotal in policy implementation, particularly in regions far from political and economic hubs. Combining studies of policy implementation and concerns about the materiality of information technology, this research problematizes the localization process of digital governance. It introduces the analytical framework termed the "frame of locality" to emphasize the dynamic interplay between national digital governance policies and local socio-economic and cultural contexts, indicating that the resolution of implementation frictions in various ways is crucial for policy execution. With the case of Guizhou, the research uncovers an inherent contradiction: the local transformation of digital governance can be hindered by its own implementation processes, thus challenging the notion of re-centralizing social governance through digital technologies. This can both challenge centrally-designed socio-technical visions and provide opportunities for more inclusive local resource allocation and for policymakers to reassess and adjust to local conditions. The study contributes to the broader understanding of China's digitization efforts by highlighting the significance of local contingent dynamics in accomplishing centrally planned objectives.

## KEYWORDS

Digital governance; China; Digital China; Guizhou; policy implementation; local governance; frame of locality

China's recent digitization projects, including the implementation of big data and cloud computing in governance, are central to the strategy of building a "digital China" (数字中国). Despite the centralization efforts of the Xi Jinping administration, policy implementation relies heavily on local agents, especially in regions distant from political and economic metropolises. This article problematizes the localization of digital governing technologies in inland China. With the case study of Guizhou Province—where China's first big data pilot zone is established, I explore how digital governing technologies are filtered by the "frame of locality" as the national strategy is implemented locally. The research reveals an intrinsic contradiction: the local transformation of digital governance could be obstructed by the very processes of its own implementation, hence posing challenges to the idea of re-centralizing social governance with digital technologies. With "thick descriptions" of how such challenge might occur, this paper suggests that as the implementation frictions are overcome or/and absorbed by the "frame of locality" in contingent ways, the centrally-designed sociotechnical

imaginaries are challenged, on the one hand; however, on the other hand, implementation frictions also offers productive opportunities for more inclusive local allocation of resources, and for policymakers to re-assess and adjust to the local social and environmental conditions.

## Frame of locality: studying the localization of digital governance

### *Policy implementation and media infrastructure*

The center-local relations' perspective, or multi-level governance approach, posits that effective governance depends on balancing centralization and decentralization (Arcuri & Dari-Mattiacci, 2010; Ostrom, 2005). Chinese scholars have discussed regulations similarly, particularly the question around "central control or coordination, or conversely local autonomy and deviation" (Shin, 2017, p. 2), discussing institutional mechanisms like evaluation system (Whiting, 2017) and fiscal redistribution (Tsui & Wang, 2004). In the past few decades, new political and economic realities have

made China's social governance increasingly complicated. From the "fragmented authoritarianism" (Lieberthal & Ocksenberg, 1988; Mertha, 2009) to the economic reforms, scholars have argued that China had undergone a decentralization of state power (Oi, 2020, p. 107).<sup>1</sup> However, while a decentralized mode of governance of "network polity" in which state actors mostly offer "facilitative leadership" emerged in Europe (Ansell, 2000, p. 311), Jeffreys and Sigley argue these transformations indicate a "regrouping" rather than a "retreating" of the government, signifying a reconfiguration of governing rationality from "government" to "governance" (Jeffreys & Sigley, 2009). This means that despite decades of decentralization, the central state still retains power from a distance through institutional and multi-level governance. Since 2012, President Xi's administration has made even stronger efforts to recentralize power, "tightening up" national policymaking (Kostka & Nahm, 2017, p. 568; Kostka & Zhang, 2018).

As such, it would be too simplistic to assume that the central state can recentralize power as in the socialist period after four decades of decentralization. Particularly, negotiations between central planning and local autonomy manifest both positive and negative results. Such studies span various fields, including contentious politics in rural and urban China (Cai, 2008; Liang, 2020; O'Brien & Li, 2006), deviations from the central planning in environmental governance (Gilley, 2017; Van Rooij et al., 2017), and poor policy designs leading to local entities' reluctance or inability to implement policies (Eaton & Kostka, 2017; Ran, 2013; C. Wong & Karplus, 2017). More recent studies also explore how local deviations and "implementation gaps" create opportunities for private enterprises, resulting in economic growth (Nahm, 2017).

Among these discussions, a crucial observation is that the traditional binary of center-local relations is inadequate to explain emerging policy implementation dynamics (Shin, 2017, p. 2). Non-traditional institutions like NGOs and private enterprises increasingly participate in local governance (Sun, 2019); scholars have also examined hybrid networks that blur public/private governance as a new form of social bio-political governance (Wang & Tan, 2020, p. 526). Indeed, a center-

local binary approach overlooks emerging non-traditional players and fails to understand how various actors impact local governance with new mechanisms (Shin, 2017, p. 3). Shin proposes a "post-hierarchical governance" framework that is "neither centre nor local" to understand China, especially regions far from the political and economic centers (Shin, 2017, p. 1). This framework suggests principal-agent relations between central and local now give space to a local, community-based professional network or relation circle. Joint discussions across old and new actors are encouraged by local policy initiatives favoring "joint exploration" of local conditions (Shin, 2017, pp. 4–5). This "community-driven-experimentalist governance" offers a new way to understand how a centrally designed policy is implemented locally. Importantly, instead of repeating the idea that national policy implementation is multifaceted – which scholars have extensively discussed, it emphasizes that new dynamics and patterns of multifaceted policy implementation are emerging and need to be identified.

This neither-center-nor-local approach is especially useful for exploring the political economy of digital technologies, as it highlights local contingencies within large-scale political support that is often seen in digital infrastructure projects. Infrastructure scholars have examined the local negotiation of key communication technologies such as undersea cables (Starosielski, 2015), digital map services (Parks, 2013), and urban dashboards (Mattern, 2015). However, as Rippa and Oakes argue, "China's own 'infrastructure turn' remains understudied and of little impact" despite the nation being a major player in infrastructural development (Rippa & Oakes, 2023, p. 549). Earlier discussions of governmental use of digital technologies in China primarily address the improvement of industrial performance under "e-governance" (Schlæger, 2010). More recent studies, though acknowledging that digital technologies like data differ from traditional resources (L. Liu, 2021), tend to focus on early ICT developments (Xiang, 2020), digital authoritarianism (Hu & Zhang, 2023), and transnational aspects like data sovereignty (Kokas, 2023; L. Liu, 2021). Works focusing on local processes of digital transformation primarily concern major cities like Shenzhen

(Große-Bley & Kostka, 2021) and Hong Kong (W. Wong & May, 2020), where major high-tech corporations are located, while neglecting that poorer inland regions do not have a dynamic local digital market to sustain large digital corporations; others still adopt a narrow focus on governmental use of internet platforms (Liang, 2020). These discussions tend to overlook the complexity of local digitization processes involving non-technical factors and new forms of stakeholders, while the focus on major cities neglects the vast still-developing inland regions. A few recent works have started to address the localization of digital governance, such as Kostka's exploration of the "digital implementation gap" (Kostka, 2022). However, empirical studies of this type are still limited.

This article intersects the political studies of policy implementation and media infrastructure scholars' concern about the materiality of information technology. Rather than focusing on a particular technological object, it problematizes the *localization* under the "Digital China" initiative. It offers both empirical evidence of intertwined local forces negotiating centrally designed digital governance policies and a theoretical lens – which I call the "frame of locality" – to explore such phenomena. Localization here refers to the adaptation and implementation of national digital governance policies by local bodies and actors within specific socio-economic and cultural contexts of locality. By doing so, the study's novelty lies in two aspects: first, it shows how underdeveloped regions, where major high-tech corporations are largely absent, struggle to overcome challenges from digitization policies; second, it provides a policy implementation perspective to study media materiality, illustrating how shifting principal-agent relations toward local communities (both governmental and private) impacts the realization of a form of governance allegedly driven by digital technology.

### **"Frame of locality" and implementation friction**

While the neither-center-nor-local approach reveals a new in-between space of policy implementation, it tends to focus on the *active* operations of local governance entities while neglecting the contingent "by-products" these processes

foster. It falls short of outlining the constantly changing interconnections within the localization process. A critical question is what are the localization processes dealing with? This article introduces the term "frame of locality," defined as *the loosely connected local material-discursive formations and relations through which new techno-political resources and policies negotiate with local conditions to be reconfigured and reproduced locally*.

The "frame of locality" encompasses the web of relations, vested interests, collective memories and shared histories, longstanding human connections, institutions, and public/private entities *preceding* the arrival of new techno-policy. Importantly, not everything local becomes part of the "frame of locality;" it depends on whether the novel techno-policies interact with a local force. The "frame of locality" is established through these interactions, and it doesn't exist before the interactions produce new relations and negotiations. Therefore, it could be understood as a type of assemblage with clear but fluid and constantly changing boundaries. Below, I outline a few of its characteristics.

First, the boundary of the "frame of locality" is defined by the *interaction* between local forces and the novel techno-policy. I adopt "friction" to conceptualize this interaction. Anna Tsing defines "friction" as "the awkward, unequal, unstable, and creative qualities of interconnections across difference" (Tsing, 2005, p. 4) that are not just negative factors but are "required to keep global power in motion" (Tsing, 2005, p. 6). Influenced by the "assemblage turn," friction provides an anchor to analyze the contingencies and ever-changing interdependent forces that make up the assemblages. Considering digital technologies, Paul Edwards reminds us how "data" as *things* flow is limited by labor, resources, and energy – what he calls "data friction" (Edwards, 2010, p. 84). Bates expands this, arguing that data friction can be "something enable and foster, rather than something to overcome" (Bates, 2018, p. 3). With cases from the US and UK, Bridges further conceptualizes the *potentiality* and *limitation* of data friction as "digital capacities" – the finite resources required for data processing (Bridges, 2024, p. 3). Informed by these discussions, I adopt "friction" to describe the negotiations, conflicts, and collaborations that emerged from a techno-policy's encounters with local forces.

Importantly, it highlights both the productive potential of conflict and negotiation and the possibilities of producing challenges and limitations. It fosters innovation and adaptation as actors work through differences to find mutually acceptable solutions, thus – in the case of this research – driving the evolution of local digital governance practices. The nature of interactions – as they integrate local forces into and set the boundary of the “frame of locality” – is precisely the resolution of local frictions.<sup>2</sup>

Second, informed by the assemblage approach to social governance and media technology,<sup>3</sup> the “frame of locality” does not assume a rigid and unchanging “structure” that determines a causal relationship. By using the word “frame” – instead of “structure” or “network” – the term attempts to avoid the orthodox “material vs discursive” debate and consider operations of both tangible objects and intangible constructions as material forces participating in the shaping of social governance and policy localization. It strives to capture the dynamic relations that are the result of both tangible constructions and discursive operations. It understands the interactions between local forces and the new techno-policies as situational, and as the concept of “friction” suggests, these interactions could be positive and negative. Therefore, obstacles are not necessarily negative and supports are not necessarily positive, because the challenges might be productive and supports could also be obstructive.

Thirdly, the “frame of locality” of one place could dramatically differ from that of another place. It problematizes the very process of *localization*, necessitating specific attention to the “locality” – understood as institutionalized political economic, environmental and cultural forces rooted in the historical development of a particular place. It manifests an infrastructural understanding of technology as “thoroughly enmeshed in society, [and] as integral components of social order” (Jasanoff & Kim, 2015, p. 2), and what Star calls an “ethnographic sensibility . . . the idea that people make meanings based on their circumstances” (Star, 1999, p. 383). As such, it would take a detailed political economy analysis or a “thick description” to delineate a particular place’s “frame of locality” as both a product and

a response to a particular techno-political localization.

Articulating theoretical resources from policy implementation studies and an infrastructural perspective, the “frame of locality” strives to describe dynamics that happen in the space between national and local, and interactions *after* the policy publication but *before* the final realization. It brings an infrastructural sensibility to the political study of the “implementation gap” problem; it also emphasizes the importance of a lens of political economy for the understanding of media materiality, especially the material-discursive formation of digital governance. The objective of identifying the “frame of locality” is not merely to describe – though such description bears importance, but to identify critical actions and moments of friction resolution. These moments open possibilities to transform the techno-policies into productive successes or/and foreseeable failures, or a hybridity of both.

The case studies discussed in the remainder of this article demonstrate one particular empirical example identifying these critical moments, contributing to understanding the localization of the “Digital China” initiative. This research, based on a year-long fieldwork, includes data from local archives, site visits, participatory observations, and over 60 semi-structured interviews. The following sections first contextualize the Guizhou Hub within the “Digital China” strategy, illustrate “joint explorations” of local digital market creation, and unearth how these operations navigate local power structures. By doing so, it identifies three types of frictions – institutional, social, and technological frictions, and how productive and contradictory outcomes are produced within local governance as frictions are resolved by the “frame of locality.”

### **Background: digital china and the Guizhou Hub**

In the past decade, China established a national strategy to utilize digital technology to transform the market economy and social governance. Particularly, digital technologies are vitalized to enhance the governing capacities of all levels of the Chinese government. In 2015, China announced the “Internet Plus” project to respond

to “the new wave of the global scientific revolution and industrial transformation” (State Council, 2015). From 2018 to 2019, the central state promoted the “New Infrastructure” project to advance the use of advanced digital technologies, including 5 G, big data, and cloud computing (NDRC, 2020). To meet data processing needs, the central state launched the “West Computes Data for East” (东数西算, hereby “WCDE”) project in February 2022, as part of the New Infrastructure project. The WCDE designed a “National Integrated Big Data Centre System” (NIBDCS) to construct eight National Data Hubs, generating data processing capacities for the nation’s digital transformation (Yan & An, 2022).

These top-designed digital technology projects are not just industrial developments but results of the central government’s vision for governance. The 13th Five-Year Plan (2016) declared a “deployment of national big data strategy,” identifying big data as fundamental strategic resources “like electricity and water” (State Council, 2016). The 14th Five-Year Plan (2021) aimed to achieve socialist modernity via “modernization of the national governance structure and governance capacity (治理能力),” with digitization as a key element. This plan also announced the “digital China” initiative, seeking to establish “a modernized infrastructural system” to “accelerate the building of digital society” and “digital government” (State Council, 2021). Digital technology is articulated as a pillar of China’s social, political, and economic governance. The Five-Year Plans embody the central state’s vision of a future “digital China,” forming what Jasanoff and Kim would call “sociotechnical imaginaries” collectively shared by the Chinese people and society (Jasanoff & Kim, 2009, p. 120).

Within this context, Guizhou Province has become vital to China’s digital governance infrastructure over the past decade. In January 2013, under the central state’s advocacy for data centers nationwide to support digital economy (*A Guide to the Construction*, 2013), Guizhou designated Gui’an new district specifically for digital infrastructure. The State Council approved Gui’an as a national-level new district in 2014 (*The State Council’s Approval*, 2014), and in 2016 the NDRC approved Gui’an as China’s first National Big Data

Pilot Zone (Hu & Pan, 2016). The WCDE initiative, launched in 2022, designated the Guizhou Hub and Gui’an data center cluster one of the eight National Data Hubs and 10 National Data Center Clusters, respectively. National New District has been a critical tool for China’s central state to test new policies (Oakes, 2023), Guizhou bears extra political vitality as a pilot zone. Notably, before its digital industry growth, Guizhou was one of China’s poorest provinces. Its development exemplifies China’s efforts to modernize poor western regions through digitization, offering insights into how technology transforms historically poor areas.

### **Make it happen: facilitating a local digital industry**

Guizhou has not failed as a National Data Hub.<sup>4</sup> In 2013, China’s “Big Three” telecommunication corporations – China Telecom, China Mobile, and China Unicom – and the world’s leading electronic manufacturer Foxconn built their data centers here (Jin, 2013; Zhao, 2013; Zhao et al., 2013). Subsequently, transnational corporations including Tencent, Huawei, and Apple followed suit. Guizhou also established one of China’s earliest provincial-level digital governing platforms, Guizhou Cloud and Big Data (云上贵州, or GCBD). In 2023, CATL – the world’s largest power battery supplier – began constructing a new manufacturing center here.

However, localizing digital governance involves more than building data centers; it requires local policy implementation and resource re-allocation – the local micro-politics – to integrate new technology into local daily life. The following cases show that *while institutional and social frictions tend to keep the resources within the previously existing old local circles of the network, this tendency helped to secure the implementation of key digitization projects; it makes these “connected” entities stakeholders and therefore accountable and incentivized to create a local digital market from scratch.* The semi-market-oriented style also opens a considerable share of financial resources to local small businesses, which further helps to sustain a newly emerged digital industry.

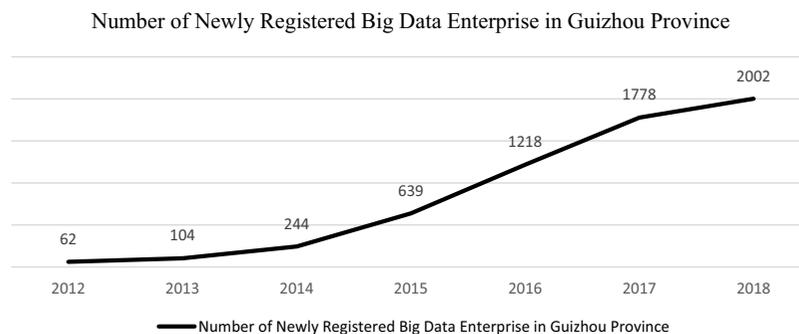
Taking a close look at the distribution of designated special funds for digitization projects, it's obvious that major supports are given to local state-owned enterprises that have been the pillar of local industrialization for decades. For example, a local high-tech zone ("High-Tech Zone")<sup>5</sup> provides an annual special fund for big data development. In 2018,<sup>6</sup> 1 million yuan was provided to "Guizhou Jianxin Data Development" ("Jianxin") for developing a "Prison Education Big Data Platform" for Guiyang's prison management system. Jianxin is a subsidiary of "Guizhou Lecent Technology,"<sup>7</sup> linked to "Guizhou Aviation Industrial Corporation (AVIC)" via a key mutual shareholder.<sup>8</sup> AVIC, a large state-owned enterprise specializing in military and civilian aviation equipment, was established in 1964 as part of China's Third Front war preparation project.<sup>9</sup> Notably, as a major site of the Third Front project, Guizhou's industrialization heavily relied on these state-owned enterprises for over six decades; conversely, these local enterprises also expanded their networks into various aspects of the local economy. When digitalization arrives, they continue their alignment with the local government through new subsidiaries.<sup>10</sup>

Additionally, new types of hybrid-owned state-related enterprises and private businesses also take a share and participate in local digitization. In 2020, for example, 1 million yuan was provided to Duo Cai Bao (DCB) – a hybrid-owned state-related enterprise – to establish the official public service mobile portal for Guizhou province (I will discuss this case shortly). GCBD is another example. Though fully owned by the state, it operates in an explicitly hybrid way. It is the province's official

digital governance cloud platform, Apple's exclusive local partner to operate iCloud China, and a local commercial cloud service provider. Its core cloud framework for digital governance was established by Alibaba, a Chinese transnational tech corporation (K. Z. Liu, 2024, pp. 16–18).

Technically, GCBD only hosts digital services at the provincial level, and municipalities and districts/counties – with designated funds – need to develop their own sub-platforms to connect with GCBD. Consequently, smaller local public/private businesses fulfil these needs. In addition to DCB, for example, 73 smaller local companies, mostly local private enterprises specializing in software development and information technology services, received funding support in 2020 ranging from 10,000 to 30,000 yuan.<sup>11</sup> These supported projects mainly focus on smaller-scale sub-platform projects.

A clear pattern thus emerged: major funds are distributed to state-owned-enterprises that historically have developed close alliances with the local government, but they are tasked with key digitization projects that bear extra political significance so they cannot fail; they also become stakeholders of and are incentivized to foster a dynamic local digital market due to their sunk cost. While smaller funds are given to smaller local businesses that help lower-level administrations develop and maintain their sub-platforms and other smaller-scale digitization projects, contrary to the general concept of free market productivity, state-related local enterprises received major support but also took on market risks that smaller private businesses are unable to endure in early market creation. The institutional frictions and the hidden social



**Diagram 1.** Number of newly registered big data enterprises in Guizhou Province 2012–2018 (Mao & Lu, 2019, p. 82).

frictions (which I implied but will articulate more shortly) – as they are absorbed by local operations of resource distribution – contributed to local market creation from scratch.

As [Diagram 1](#) shows, Guizhou's local digital industry had a high growth rate albeit such a market almost did not exist before; the number of newly registered big data enterprises in Guizhou was minimal before 2013 but underwent dramatic growth since then. Additionally, local government also underwent large-scale digitization. Under the strategy of “one cloud, one network, one platform,” over 88 provincial departments and 9 municipalities integrated their workflow and database into GCBD (The Information Office of Guizhou Province, 2022). As a result, a complex local digital industry network is formed, where the government fosters the market but maintains strong dominance through state-related entities.<sup>12</sup>

### **Collaborations and conflicts: local networks and contingencies**

The above case has demonstrated that on the one hand, local networks (especially state-related entities) share a major portion of resources brought by digitization; on the other, such institutional friction burdened state-related local entities with tasks to realize key projects. A growing local digital market also serves these entities' best interest as they have incurred sunk costs. Private sectors take smaller shares but benefit from a growing local market. This dynamic contributed to market creation when there was no digital industry at all. However, as the techno-policies of “Digital China” interact with more local forces hence encounter “frictions,” the nature of dealing with frictions becomes more complicated: both positive and negative results occur; productive frictions could create obstructions and vice versa. An assemblage of dynamic relations and interactions emerge as these encounters happen, setting the boundaries – situational and fluid – of the “frame of locality” of digital localization in Guizhou. Particularly, social frictions and institutional frictions derive from encounters between techno-policies and preexisting local conditions, producing unexpected outcomes. This section details how the frame of locality produces and resolves

implementation frictions, opening possibilities for re-assessing local policymaking.

### **B2G business and the old local human connections**

As a new network of relations emerges from the encounters between digitization resources and local public and private sectors, old local human connections become vital. Especially, whether the “frame of locality” successfully absorbs or/and overcomes social frictions becomes key to the techno-policy implementation. A clear emerging tendency is that technological capability is replaced by social connections as the scarce source. Here, I use a series of case studies from the Duo Cai Bao (DCB) operation as examples. DCB is a representative of hybrid state-private ownership and both political and market-oriented operations. Its establishment and operation are a vivid illustration of the localization of the techno-policies of “digital China.”

DCB was first established by the provincial government as a state-owned enterprise devoted to key digitization projects. DCB is a subsidiary of the largest local media corporation GOG, a state-owned media group co-founded in 2014 by Guizhou Daily Paper Group, Guizhou Broadcast and Television Network, Contemporary Guizhou Journal, and Media Group – major state-affiliated entities that dominate local newspaper, magazine, television, and radio broadcasting markets. As a subsidiary, DCB was established to develop and operate the official mobile portal of the Guizhou provincial government's public services, making them digitally manageable and available to ordinary citizens ([Figure 1](#)). In a way, it is the user-end interface of GCBD's digital governance cloud.

Additionally, DCB is also a software development company that competes for local governmental digitization projects. Senior Project Manager Chen at DCB explained that “at the level of municipal departments and bureaus . . . . even though GCBD has provided a paper-less work platform . . . , they (municipal departments and bureaus) still have needs to maintain and upgrade their own [sub-]platforms.” What's more, these bureaus also have a digital maintenance budget – received from their upper-level administration – to spend.<sup>13</sup>

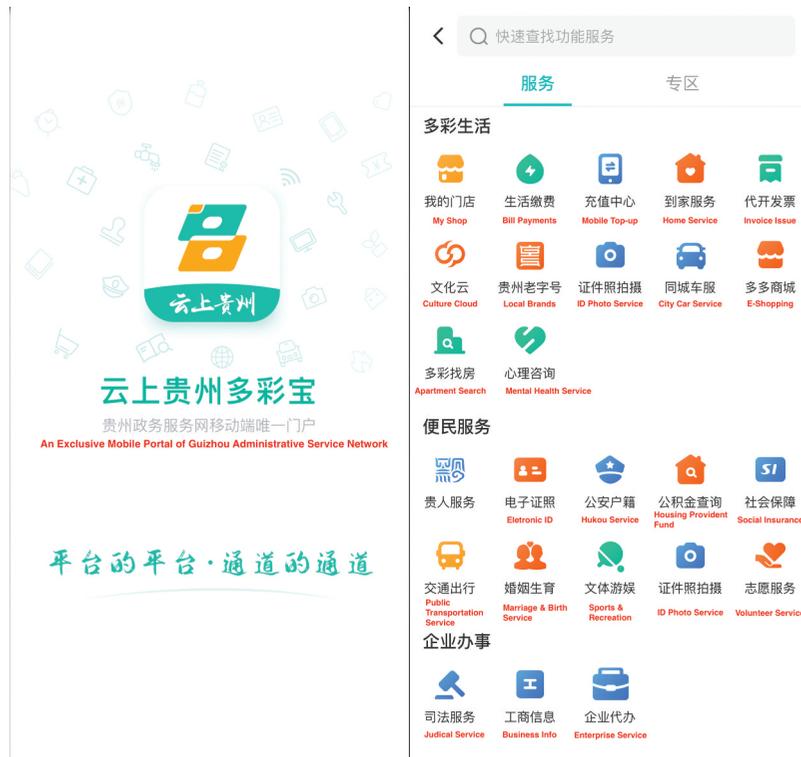


Figure 1. DCB's app interface (English titles added by the author).

For these sub-platform digitization and maintenance projects, two typical conditions can be identified. First, they do not require cutting-edge high technology, so high-tech corporations like Alibaba or Tencent are not needed, opening opportunities for smaller local enterprises. Second, as government digitization budgets enter the local market, a “B2G” (business-to-government) market emerges. During my fieldwork, employees from various local technology companies mentioned that they mostly rely on government projects, and few survive solely by working with private enterprises. Consequently, technological capability is not scarce, human connections, or *guanxi* (关系), become critical.<sup>14</sup> Anyone can hire software developers if the pay is good, but not everyone has the right connections to obtain government projects. Cases such as a company started coding a database application for a B2G project before the open bid even started and turned out winning the bid later because “the boss has a relationship” is not exclusive in my fieldwork. Under the fancy banner of “big data,” “digital governance” and “cloud,” social friction, instead of technological capacity, appears

as the primary force in local resource distribution in a semi-free market where these entities still compete.

### “Not a puppet” and “let it rot”

Of course, the interplay of encounters with local forces that creates institutional and social frictions operates in more complicated ways than just determining who gets the project. These encounters and interactions involve complex and contingent negotiations between humans and within different branches of local government. Continuing the DCB's case study, two observations are further revealed: First, government-established platform companies are not merely puppets; they operate autonomously and market-oriented, constantly bargaining with the government and seeking their own economic interests. Second, competition and conflicts of interest exist between different government-supported entities and branches. Human connections are critical, but unexpected conflicts arise from the broader bureaucratic structure. These phenomena are case-specific and involve

factors outside the policymaker's vision, producing unintentional results. As digital techno-policies encounter local institutional and social frictions, both positive and negative outcomes can be identified.

Though entities like DCB dominate the local B2G and digitization market, their relationship with the government is not a top-down hierarchy. DCB was 100% state-owned when first established but suffered poor financial situations initially. Instead of intervening, the government let DCB seek private investment. Then, with 6.7 million yuan investment from Zhejiang Longxiang, DCB became a hybrid-owned enterprise.

A manager at DCB explained their relationship with the local government:

We need to comply with the government, but it is also impossible for us to do everything they told us to . . . . . We don't want the government to lead us by the nose (牵着鼻子走). "The government might support and incubate local enterprises, but it cannot control or ensure their success . . . . . In most cases, the government plays a supportive role," Manager Li said.<sup>15</sup>

When working collaboratively, DCB establishes good human connections with particular governmental bureaus. In 2022, the State Council (2022) tasked Guizhou's Ministry of Commerce (MOC) to develop "local public brands." The MOC staff sought DCB's help to implement this policy. According to Manager Li from DCB, members from both sides met dozens of times and revised the plan before presenting it to the Head of MOC. Significant in this process are the back-and-forth discussions between the DCB team and MOC staff – who developed close working and even personal connections, highlighting the government's reliance on business enterprises to formulate plans. "Sometimes they have no idea about what to do," a project participant said, "and they need us to help them figure out their policy." This policy was implemented relatively smoothly; collaborative relationships were established and turned out to be productive.

In other cases, things become very different. In the following case, not only did social friction become obstructive, institutional friction within the bureaucracy and an emerging technological

friction derived from the political economy of data capitalism intertwine into an assemblage of relations that produced negative outcomes. Importantly, the obstruction does not come from outside but within the very process of the frame of locality created by the policy implementation, but this time, the frictions are not successfully absorbed and overcome.

In 2022, as part of the "Digital China" strategy, the central state promoted a "15-minute circle of convenient urban life" initiative – a 15-minute walking distance from one's residence (hereby "the 15-minute"). As part of the policy, 12 state departments required local governments to establish "local smart platforms" to "break the top monopoly, [and] establish a platform overseen by the (local) government and [provide] relatively low cost to (local) businesses" (*Advice from 12 ministries*, 2021). To implement this policy locally, in October 2021, 15 provincial ministries co-released a guideline, urging local governments to establish a "15-minutes" platform based on DCB ("15 ministries," 2021).

Now, DCB was to establish an e-commerce platform for local small businesses. With official endorsement, DCB sent promotional teams to Subdistrict Offices in Guiyang City to set up pilot sites, and staff members of the Subdistrict Office were required to support DCB's team. The MOC even released 10-million-yuan consumer vouchers distributed exclusively through DCB to stimulate the local market. In 2022 alone, a few thousand local businesses enlisted on DCB.<sup>16</sup>

However, the Subdistrict Office staff members told a different story. "Initially, we promoted DCB's platform actively – as instructed by our upper administrator – and indeed saw some success," subdistrict staff members told me in late 2021.<sup>17</sup> However, six months later, things had changed. "Now we just pretend that we are doing the job, but we are actually doing nothing." "Why," I asked. "Because the district also has its own platform established by the district government in response to the same initiative ('the 15-minute'), and it is developed by a company established by the district government," they said. "People [from the district company] ask why we promote DCB's platform – a platform unrelated to the district government." They continued, "data can be processed and sold, and data generated on DCB will end up as DCB's profit. The district platform also wants these

data because these are profit.” As a result, they concluded, “now we just let it rot (摆烂).<sup>18</sup>” “Plus,” they added, “we have better relations with the district company people as we often work together on other projects.”

Two concurrent dynamics are evident: First, DCB’s primary role is implementing the provincial government’s key digitization project, a pattern discussed above. Second, DCB competes with others – in this case, the company established by the district – and doesn’t always win.

More importantly, three implementation frictions emerged as “the 15-minute” as techno-policy encounters local forces (and produces new interactions that define a frame of locality): first, institutional frictions emerged from conflicts of interest within the local bureaucracy. Both provincial and district governments, responding to the same “15-minute” digitization policy, tasked enterprises to develop local e-commerce platforms, leading to competition over market share. Second, social frictions occur when staff members of the government establish relations with technological companies. However, social frictions – even the same kind of collaborative relations between people from the government and technological companies – are not always productive (as in the DCB-MOC case), nor are they always obstructive (as in the DCB-subdistrict case). Third, and most invisibly, technological friction is created by the logic of data capitalism.<sup>19</sup> As a new kind of raw material that’s capitalizable, data’s profitability intervened in the traditional bureaucratic structure, enlarging the institutional conflicts.

As such, conflicts and negotiations would persist until all parties – provincial and district governments, DCB, and the district company – get a share of the cake, or until the cake is no longer available. Nevertheless, precisely due to the assemblage nature of the frame of locality, local policymaker’s intervention would always bring new forces into the assemblage that would potentially alter how frictions are absorbed and overcome, thus changing the implementation result in ways that attuned to local benefit.

In short, the localization of digital governance techno-policies, despite central state support, doesn’t occur in isolation. Instead, it is akin to newcomers entering a family party – an established

social network – where preexisting connections and interests must be navigated, and mutual interests must be established before the newcomers become *local*. Metaphorically, when the newcomer navigates through the family party – making personal contacts, navigating the house, getting to know where to get the utensils, these interactions – which create new relations with people, objects, and organizations – constitute the “frame of locality.” At first, the newcomer might get a cold reception from somebody, get lost in finding the kitchen, and even break a glass, but as she gradually resolves these social and technical frictions in one way or another, she eventually finds a place in the party and becomes a local. As newcomers integrate, implementation frictions are both produced and resolved.

A “frame of locality” approach to local implementation helps to delineate the productive/obstructive dynamics of frictions and the assemblage nature of the “frame of locality.” It thus contributes to identifying the contingencies within local “joint explorations” and the strategically conversing possibilities of locally attuned policymaking. Importantly, rather than overemphasizing the determining power of the local assemblage, I would like to highlight that humans can always intervene in the moments of friction resolution. In other words, within the “frame of locality” there are “people as infrastructure” where the ability of humans to engage with complex relations and practices reproduces new possibilities (Simone, 2004, pp. 407–408).

## Conclusion

This study identified three types of friction – social, institutional, and technological – encountered by digital governing techno-policies within the “frame of locality.” Social friction arises from human connections and *guanxi* influencing the distribution of digitization projects. Institutional friction involves conflicts and negotiations within governmental and state-owned institutions. These frictions are particularly evident in the competitive dynamics between DCB and other local entities, where overlapping jurisdictions and conflicting interests hinder seamless policy implementation. Technological friction is encountered as the nature of data-based

platforms is undergirded by the economic logic of data capitalism, while local policymaking failed to address this technological feature new to the local governance. Together, these frictions illustrate the complex, multi-layered nature of policy localization, where overcoming these frictions involves continuous negotiation and adaptation, ultimately shaping the localized outcomes of national digital governance initiatives. *The “frame of locality” approach critically foregrounds that techno-policies are not “implemented” but “re-produced” locally.* The former implies a top-down power relation while the latter is a locality-based complex of productive assemblage (that also contains conflicts and failures).

Importantly, frictions are both productive and obstructive; depending on the situation, the very same type of friction could produce drastically different outcomes. For example, institutional friction fostered a local tendency to allocate digitization resources to old and new state-owned entities, and this also made large-scale local state-related sectors incur sunk investments and bear extra political pressure in realizing key digitization projects. Consequently, these entities took on the early market risk, while a digital market did not exist and became the stakeholders in a growing local digital industry, which later benefited small businesses and private sectors. Nevertheless, institutional friction became an obstacle in the case of DCB’s competition with the district company on the user data of the local e-commerce platform. Interestingly, the kind of social frictions that caused the subdistrict office staff to “let it rot” – that they have developed a closer working relationship with the district company – were the same kind of relationships that contributed to DCB’s successful collaboration with the MOC on the “local branding” project.

Guizhou’s case is valuable in the sense that as China’s first big data pilot zone, it serves as a testing ground for policies that may be implemented nationwide. With the “frame of locality” as an analytical lens to understand the locally based implementation frictions and contingencies, this study moves beyond the traditional center-local framework and highlights the fluid and everchanging assemblage nature of the local network of power and resource negotiations

when it comes to policy implementation. In the technological sector, such as national strategies like “digital China” that heavily invests in digitization projects, the techno-policies not only encounter preexisting local networks, emerging community-based connections, and local bureaucracy but also bring in new rationalities of political economy such as data capitalism that are stranger to local policymakers. Understanding the “frame of locality” as a fluid assemblage defined by the ongoing interactions between the new techno-policies and local conditions means that, on the one hand, there are no predetermined positive or negative outcomes of implementation frictions, and on the other hand, there are always possibilities for local institutions to be involved with the resolution of the implementation frictions for a more locally beneficial way of policymaking.

Eventually, the “frame of locality” presents both challenges and opportunities for equitable policies. Addressing implementation frictions involves asking how new technologies and policies can be leveraged to benefit more participants, ensuring broader, more effective localization strategies. While the Guizhou Hub is one case, additional comparative studies are needed – such as other national pilot zones. Nonetheless, this analysis contributes to understanding how China realizes its “Digital China” vision, involving implementation gap, technological localization, the global expansion of data capitalism, and the revitalization of a mode of centralized governance via digital technology.

## Notes

1. Also see (Jeong, 2007; Landry, 2008; Zhang, 2015)
2. Few studies have used the concept of “friction” to examine digitization in China, which this paper attempts. This may be due to the unfamiliarity with the concept among Chinese audiences. For example, Anna Tsing’s *Friction* has no Chinese translation, and her *Mushroom at the End of the World* was only translated in 2020.
3. This article does not engage in the theoretical debate on assemblage theory. But as a context, the “assemblage approach” refers to the broader “assemblage turn” in the critical cultural studies and infrastructure studies, following Deleuze and Guattari’s formation (*Deleuze &*

- Guattari, 1987*). It is broadly understood as “a particular constellation of articulations that selects, draws together, stakes out and envelopes a territory that exhibits some tenacity and effectivity” (Slack & Wise, 2005, p. 156).
4. Although largely ignored in academic discussions, a few scholarly works address Guizhou’s case. Urban studies scholar Oakes explored the infrastructural construction of roads in Gui’An district (Oakes, 2022, 2023), and Liu detailed the political economy processes of Gui’An becoming a data hub (K. Z. Liu, 2024). This paper further explores localized operations not fully captured by these studies.
  5. This is a special developmental zone established by Guiyang’s municipal government in 1992 to pilot new technological industries under the approval of the State Council.
  6. For the original governmental document of the special fund project list, which includes both cases discussed below, see (2018 List, 2018). Similar funding supports are not unique to the High-tech Zone; every administrative district of Guiyang has the same type of special fund. For example, the full list of support by the Big Data Industrial Development Special Fund in 2020 and 2021 can be accessed at (2020 List, 2020; 2021 List, 2021).
  7. This English name of the company is directly cited from the company’s website. The word “lecent” is probably made up by the company as a transliterate of its Chinese name “le chen.”
  8. The above information is collected by the author from the “National Enterprise Credit Information Publicity System” (NECIPS), an information platform established by the State Administration for Market Regulation (SAMR) of China. SAMR is the official database for company registration information in China.
  9. The Third Front project is a national movement initiated by Mao Zedong in the 1950s, relocating China’s major industrial sectors and national defense industries from the coastal regions to southwest China to prepare for potential nuclear war with the US and the Soviet Union. This includes the migration of millions of workers and engineers to Southwest China. For more on the Third Front project, see (Meyskens, 2020).
  10. Similar cases are ample. Another example: two out of three local brands that received 1-million-yuan special fund each in 2020 were fully state-owned – Guizhou E-Commerce Cloud Operating Co. and Guizhou Aviation Cloud Technology (another enterprise from the old Third Front project).
  11. (2020 List, 2020) The list is categorized by administrative districts and business types, so it’s easy to see how every district of the city follows the same pattern.
  12. Notably, similar dynamic has been observed by China scholars with case studies elsewhere, such as the study of intelligent connected vehicle in Hunan province by Xu et al. (2022) (“(Re)Shaping Urban Governance”).
  13. Interview conducted by the author on March 23, 2022.
  14. *Guanxi* has long been studied by scholars as a pivotal mechanism for resource distribution in the Chinese culture. For more on the study of *Guanxi*, see (Kipnis, 1997).
  15. To make personal identity anonymous in the case presented here upon informants’ requests, personal information including name, gender, title, and so forth are intentionally blurred out. For example, names are replaced, job titles are blurred out, and I use they/ them to avoid gender implication.
  16. This information was collected from my interviews with local staff members and an internal document, both are to be made anonymous.
  17. I conducted multiple interviews with staff members at the Subdistrict Office across about 6 months from 2021 to 2022 to track the progress of this project.
  18. “Let it rot” is a newly emerged popular phrase used by young generations Chinese to indicate a behavior of passively working to protest meaningless or overload works. The informant used the word here to indicate how they pretend to promote the DCB platform but are not actually doing any real work.
  19. “Data capitalism” is understood as a system through which user data is commodified by data mining business and platform companies and the resource of data is uneven distributed toward commercial entities but not users. For a detailed discussion, see (West, 2019).

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Notes on contributor

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