

Data-Hub for Effective Local Government Service Delivery in Bangladesh: A Case Study of Union Parishads

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Abstract

This paper explores the opportunities and challenges of data-driven service delivery at the local government level in a developing country context, focusing on Union Parishad, the lowest tier of local government in Bangladesh. Through systems mapping and qualitative methods, the study examines the relationships, power dynamics, and systemic barriers affecting data-driven services in four unions. It reveals a data dependency among Government Organizations (GOs) and Non-Governmental Organizations (NGOs) that limits independent decision-making, leading to inefficiencies. The Union Parishad lacks authority in delivering data-driven services, compounded by data

unavailability, manual storage practices, limited data sharing coordination, and resource constraints. The study highlights the need for a data hub to improve service delivery, while emphasizing that decentralization is crucial for the hub's effectiveness. The key argument is that data hubs and decentralization must work together to ensure efficient data-driven public services at the local level.

Keywords: Data-driven Service Delivery, Data Governance, Data-hub, Local Government, Bangladesh.

1 Introduction

Data-driven service delivery is an effective local governance approach, particularly in situations with a high level of uncertainty, such as natural disasters or pandemics (Benfeldt et al., 2020; Veenstra & Kotterink, 2017). For the purpose of this paper, we conceptualize data-driven service delivery as the systematic use of digital data to inform, design, implement, and evaluate public services (Veenstra & Kotterink, 2017). In the realm of local governance, the effectiveness of data-driven service delivery is contingent upon a myriad of factors such as power, authority, and institutional practices of local government bodies, as well as the intricate dynamics of power and relationships between these bodies and various other service providers (Castro & Lopes, 2022; Effah & Nuhu, 2017; Fernandez & Rainey, 2017; Gill et al., 2014). Therefore, successful implementation of data-driven service delivery requires a deeper understanding of the complex systems in which local government bodies operate and are connected to different stakeholders for service delivery (Storm & Borgman, 2020; van Ooijen et al., 2019).

Despite ongoing decentralization efforts and increasing emphasis on digital governance, Union Parishads in Bangladesh continue to face systemic and structural challenges in implementing data-driven service delivery (Panday, 2017; Panday, 2011). These include

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fragmented data systems, manual storage practices, poor coordination among stakeholders, and institutional power asymmetries (Hossin et al., 2023). The absence of a structured data governance framework at the union level further exacerbates these issues, limiting the potential of data to inform and improve public service delivery. The aim of this paper is to gain a deeper understanding on the systems of data-driven service delivery of local government at the union level. Specifically, it seeks to understand how power dynamics, data dependencies, and governance structures influence the effectiveness of local level service delivery. Informed by systems mapping framework, the study examines the interactions between government organizations (GOs) and non-governmental organizations (NGOs) in delivering public services at the union level (Pomeroy–Stevens et al., 2022). The broad research question driving this inquiry is: How do institutional practices, power relations, and stakeholder interdependencies affect the implementation of data-driven service delivery at the union level in Bangladesh? To address this, our study sets out three specific objectives: i) to analyze the vertical and horizontal relationships among service providers; ii) to identify systemic barriers to data utilization; and iii) to assess the potential of decentralization and data hubs in enhancing responsive local governance.

This study employed a combination of Key Informant Interviews (KIIs) with representatives from both the Government Organizations (GOs) and Non-Government Organizations (NGOs) at the union-level. Drawing on the KIIs, analyzing documents and Citizen's Charters⁵, this paper identified a data dependency relationship among GOs and NGOs at the union level. Additionally, this paper revealed that the Union Parishad has limited decision-

⁵ A Citizen's Charter is a formal document in which an organization conveys the details of the services they offer, service delivery criteria, process, and all the relevant information.

making authority in implementing data-driven decisions. Concurrently, the systems mapping reinforces decentralization as a necessary precondition for the effective use of the data hub. By applying systems mapping, the study offers a holistic view of the actors, relationships, and barriers that shape service delivery outcomes. The findings have both theoretical and practical significance: they contribute to academic debates on data governance and decentralized decision-making and offer actionable insights for policymakers seeking to strengthen local government institutions.

The structure of this paper is organized as: Section 2 briefly presents the relevant literature review on the significance of data in decentralized service delivery and the preconditions for the effective use of data. Section 3 delves into the methodology employed and the key findings are presented in Section 4. This paper concludes with the summary, academic contribution and the policy implication of this research, discussed in Section 5.

2 Literature Review

Over the last decade, there has been a growing recognition of using data in the planning and provision of public services (Agbozo & Spassov, 2018; van Ooijen et al., 2019). Data are crucial for understanding everyday problems in public lives, engaging people, and offering insights for improving public services that address and respond to public demands (van Ooijen et al., 2019). A recent body of literature on Data-Driven Public Sector (DDPS) identified data as a resource that is essential to public sector management, policymaking, and service delivery in innovative ways (Hossin et al., 2023; Misuraca et al., 2020). These studies also reveal that the government's strategic approach to developing a DDPS can positively impact the outcomes they produce by encouraging data-driven service design and evidence-based policy making.

Earlier studies showed how data can transform public service delivery, including how it can be used as an effective tool to improve societal well-being and how it can ensure good governance at the grassroots level (Agbozo & Spassov, 2018; van Veenstra & Kotterink, 2017). For example, during the Ebola crisis of 2014, several cases have demonstrated that data exchange and analysis can significantly improve people's health or even save lives (Cori et al., 2017; Etang & Himelein, 2020; Leach, 2015). According to another study of 2017 in UK, the reliance on data dramatically raises the accuracy of cardiovascular risk prediction, identifying more patients who may benefit from preventive care, while excluding others from needless treatment (Weng et al., 2017). The significance of data-driven service delivery has been further demonstrated by the current global crisis of COVID-19, which has pushed for the demand of a data ecosystem for effective, efficient, and timely service delivery (Hasan et al., 2022; Ros et al., 2021; Starnini et al., 2021).

In the context of local government service delivery, collecting and responding to data is a critical governance approach at the grassroots level (Lewis, 2017). In addition, there is a pressing need for demand-based innovative service delivery with limited resources (Osah & Pade-Khene, 2020). Another key feature of present-day local governance service delivery is the collaboration of different service providers, such as elected representatives, transferred departments⁶ of Government, and NGOs (Vitálišová et al., 2021). As a result, a massive amount of data is produced and stored in the process of management

⁶ "Transferred Departments" refer to the service delivery departments of the government of Bangladesh. The Upazila Parishad (UZP), as the elected governing body, is formally tasked with overseeing and coordinating the activities at the Upazila level, including the seventeen service provider departments that have been placed under its jurisdiction, collectively known as the "Transferred Departments."

and service delivery of local government bodies (Sayogo et al., 2023). Often, these data are overwhelming, outdated, repetitive, and sometimes difficult to operationalize (Bibri, 2021). However, if organized in a planned and coordinated way, these data have the potential to assist the local government bodies in delivering public services in a more effective, efficient, and responsive way (Shibambu, 2019). If a data hub is established, this data can also be used meaningfully by distributing scarce resources of local government bodies to the priority areas, reducing time for both the service providers and the citizens (Benfeldt et al., 2020; Maffei et al., 2020). Additionally, it offers a critical insight into the pressing issues faced by local areas, particularly those associated with high costs and resource constraints. Therefore, local government bodies in many developed countries are relying on a data hub and thus offering better services regardless of resource constraints (van Ooijen et al., 2019).

Although data-driven service delivery has emerged as a transformative approach in local governance globally, Bangladesh has yet to fully harness its potential at the grassroots level (Huque & Ferdous, 2024; Khan et al., 2019). While developed countries have successfully implemented data hubs to improve service efficiency and resource allocation, local government bodies in Bangladesh, particularly at the union level, continue to operate without such infrastructure (Baroi & Alam, 2021). Despite national-level efforts to establish public sector data repositories, the absence of a localized data hub reflects deeper institutional challenges, including limited decentralization of decision-making authority, inadequate technical capacity, and entrenched power dynamics (Matheus et al., 2020; van Ooijen et al., 2019). Moreover, although a vast amount of data is generated through collaborative service provision involving elected representatives, government departments, and NGOs, this data often remains fragmented, outdated, and underutilized

(Sayogo et al., 2023). The potential of a well-organized data hub to enhance responsiveness, reduce service delivery time, and prioritize resource distribution remains largely unexplored in the Bangladeshi context. Therefore, a significant research gap exists in understanding the institutional, technical, and governance preconditions necessary for establishing and sustaining data-driven service delivery mechanisms at the union level. This paper seeks to address that gap by examining the feasibility, challenges, and transformative potential of localized data hubs within Bangladesh's unique administrative and socio-political landscape.

3 Methodology and Theoretical Framework

This study utilizes qualitative methods to understand the relationships, power dynamics, and systemic barriers affecting data-driven decentralized decision-making processes within government entities and NGOs operating at the union-level in the study region. We predominantly employed a combination of key informant interviews (KII) with representatives from both the governmental and non-governmental organizations at the union-level.

To explore the nuanced and context-specific challenges of data-driven service delivery at the union level, a qualitative research approach is both appropriate and necessary. This method allows for a deep, interpretive understanding of complex relationships, institutional practices, and power dynamics that shape service delivery processes (Ospina et al., 2018).

3.1 Study Location

For this study, we chose the Satkhira district in the Khulna division in the southwest region of Bangladesh. Specifically, we focused on four unions- Dhandia, Khesra, Kumira, and Tala- which are situated in Tala Upazila within the district. The study location- union-level local

government institutions in Bangladesh- has been deliberately chosen because it represents the lowest grassroots tier of governance, where service delivery intersects directly with citizens' everyday lives. Unions are often resource-constrained, politically embedded, and institutionally fragmented, making them ideal sites for examining the feasibility and challenges of implementing data hubs. Moreover, unions serve as a microcosm of broader governance dynamics in Bangladesh, offering insights that are both locally grounded and nationally relevant.

3.2 Study Design

This study involved the process of mapping organizations, listing the services, assessing the service delivery process, assessing the current data usage and determining the specific data needs in four chosen unions. We did this through the utilization of KIIs, document analysis, analyzing the Citizen Charter and field observations. Key informant interviews were selected as the primary data collection technique to engage directly with the individuals who possess insider knowledge of institutional processes and decision-making structures (Taylor & Blake, 2015). These include elected representatives, government officials, and NGO personnel who are actively involved in service delivery at the union level. This method enables the study to capture diverse perspectives and uncover hidden institutional logics that may not be documented or publicly visible (Head, 2008). The data collection process involved several visits to the GOs and NGOs to understand the different types of services they provide, identify Key Informants (KIs), check the availability and constant of KIs to conduct interview, the format of data regularly used by the office, seek consent to share data, and determine data needs for operational effectiveness. KIs were nominated by their colleagues in each organization based on their willingness to speak

openly during interviews and who knows most of the details of the service delivery process. Table 1 exhibits the number of organizations by types.

Table 1. Number of organizations by type

Union	Government Organizations	Educational Institutions	Financial Organizations	NGOs	Total
Dhandia	10	7	2	11	30
Khesra	15	6	2	7	30
Kumira	9	6	1	14	30
Tala	16	3	3	8	30

The process of document analysis entailed visiting organizations and evaluating their information storage system and communication tools, which included registers, charts, and banners. This allowed us to identify the service types, service delivery procedures, and comprehend the horizontal and vertical relationships, power dynamics, and possible systemic barriers. A research team comprising two members including a field researcher and a community researcher have collected the data in each union. The field researcher was responsible for ensuring research protocols during KIIs, and the community researcher with local knowledge to facilitate engagement. Their tasks included: obtaining legal authorization, collecting relevant paperwork, and conducting 30 KIIs in each union. Field data collection took place from April 22, 2024 to June 2, 2024.

All the interviews were conducted in *Bangla* language, and were digitally recorded, transcribed, and supplemented by the notes of field observations. Transcribed data, field notes and observations were then analyzed thematically. Thematic coding was employed to identify recurring patterns, contradictions, and emergent themes across interviews (Clarke et al., 2015). This approach allows for a systematic yet flexible interpretation

of the data, ensuring that findings reflect the complexity of the local governance environment while remaining analytically rigorous (Terry et al., 2017).

3.3 Theoretical Framework

In order to develop a comprehensive data governance framework, earlier studies on data governance and service delivery argues for systems mapping to understand how multiple actors of service delivery are constituting a system and how these actors are connected to each other in delivering services (Cavill et al., 2020; Micheli et al., 2020; Pomeroy–Stevens et al., 2022). Systems mapping has been identified as a useful framework to improve the planning and implementation of data-driven service delivery through promoting the use of systems thinking (Alhassan et al., 2016; Faezirad & Khoshnevisan, 2023; Ruijer, 2021). Systems mapping is a conceptual and analytical approach rooted in systems thinking, which seeks to understand how various components within a complex system interact, influence, and depend on one another (Pomeroy–Stevens et al., 2022). It involves visualizing relationships, feedback loops, and structural patterns among actors, institutions, and processes to reveal the underlying dynamics that shape outcomes. In governance and service delivery contexts, systems mapping helps identify leverage points, bottlenecks, and interdependencies that are often obscured in linear or siloed analyses (Pereira et al., 2017). By embracing complexity, it enables more holistic and adaptive planning, especially in environments marked by resource constraints and institutional fragmentation.

In this present study, systems mapping is employed as the theoretical framework to unpack the intricacies of data-driven service delivery at the union level in Bangladesh. The decision to adopt this framework emerged organically from the key informant interviews, where respondents

consistently emphasized the interconnected nature of service provision, highlighting vertical and horizontal relationships, power asymmetries among actors, and systemic barriers to effective data use. These themes reflect a dynamic and multi-actor system that cannot be adequately understood through isolated variables or linear models. Systems mapping allows the study to trace how governmental and non-governmental entities co-constitute the service delivery ecosystem, how data flows across institutional boundaries, and where interventions might be most impactful (Benfeldt et al., 2020). By grounding the analysis in systems thinking, the study aims to generate insights that are not only descriptive but also actionable for designing a more integrated and responsive data governance framework.

4 Study Findings and Discussion

We report the study findings across three thematic categories. In Subsection 4.1, we present the vertical and horizontal data dependencies of GOs and NGOs at the Union level. Subsection 4.2 explores power dynamics among various actors responsible for service delivery at the union level, while Subsection 4.3 addresses the systematic barriers to data-driven service delivery.

4.1 Union's Vertical and Horizontal Data Dependency Relationship

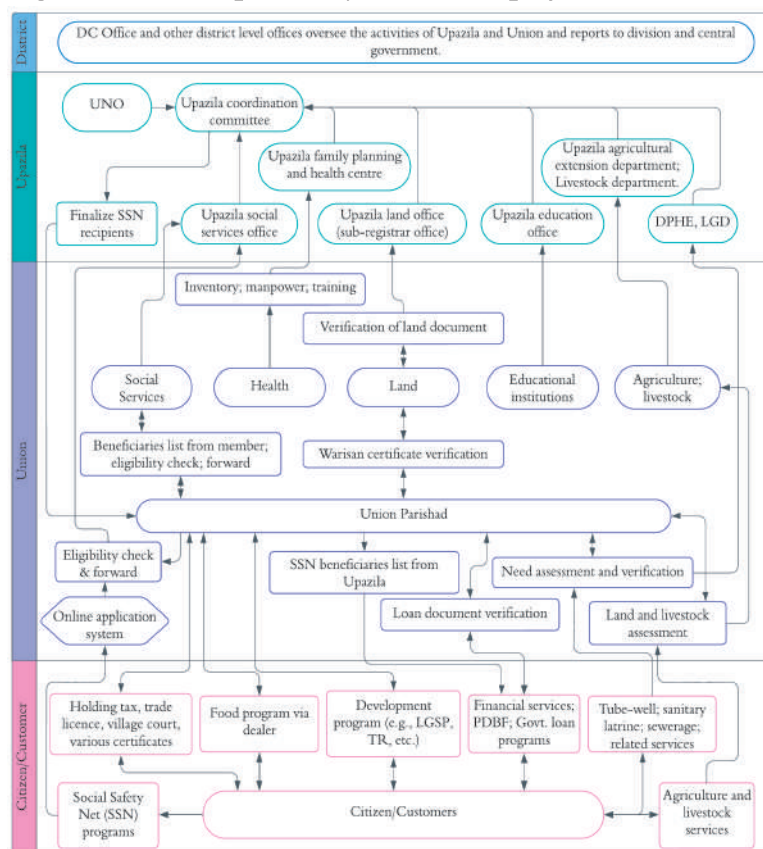
This segment of the paper presents the vertical and horizontal relationships of the Union Parishad, with particular reference to KIIs. These interviews revealed a data dependency relationship between the Union Parishad (UP) and the transferred departments at the Upazila level, as well as interactions among the Union Parishad, Union-level GOs, and NGOs.

4.1.1 Government Organizations

Drawing on the interviews and citizens charters of the four Unions (Dhandia, Khesra, Kumira, and Tala) of Tala Upazila, vertical and horizontal data dependency relationship has been explained through Figure 1. This Figure shows the dependency relationship and indicates how government organizations (GOs) are relying on each other for data support and decision making. These relationships are illustrated in four horizontal segments. Beginning from the bottom, the first segment represents citizens. Moving upward, the second segment depicts Union-level offices. Further up, the third segment exhibits Upazila-level offices, and finally, the top segment represents District-level offices. All shapes in this figure are interconnected by arrows. Single arrows denote unidirectional relationships, while double arrows indicate bidirectional relationships.

At the bottom panel of Figure 1, the citizen level has been depicted. Government Organizations provide seven common types of services to a citizen through a direct involvement of the Union Parishad. Union-level health facilities and educational institutions provide services directly to a citizen under the supervision of respective Upazila level offices. Among these seven services, a few services are provided independently by the Union Parishad, such as, holding tax, trade licenses, various certificates (e.g. Citizenship, Character, Identification Certificate), food program via a dealer, union-level development programs etc. Rest of the services are provided with the support from or in association with Upazila and District level offices. For some services, Union Parishad also work together with other union-level Government Organizations.

Figure 1. Data dependency relationship of the GOs



Note: This flowchart is drawn based on the KIIs' interview and citizen charters of a sample union.

An illustrative case of a social safety net program from Figure 1 have been discussed to convey a comprehensive description. The KIIs from the Upazila level departments detailed the stages of data collection, verification, and validation for a social safety net program. Initially, citizens applied online. Their application and documents are then verified at the village level by ward members and police. Verified documents are sent to the Union Parishad Chairman, who prepares a list of potential recipients and forwards it to the Upazila level. Finally, the

Upazila gathers lists from all unions to finalize the recipients. One of the KIIs from Tala Upazila Social Service Department explained this multiple staged process of data verification and validation:

To avail of different allowances, a citizen submits their online applications. Then, with the copy of that online application, the citizen submits it to the respective ward member/UP Chairman. Then, the respective ward member verifies the documents with the support of Village Police and submit the list of applicants to the UP Chairman. Then, the UP Chairman further verifies the documents by themselves and send the list to the Upazila Shomajsheba Office (KI, Tala Upazila Social Service Department).

Despite the online application system, citizens must submit hard copies, and the Union Parishad conducts manual eligibility checks before forwarding applications to Upazila offices. The Upazila officers finalize the recipient list based on central government allocations, limiting the Union Parishad's authority and leading to inefficient service delivery due to vertical dependency and manual processes. Other government organizations, like the Department of Public Health Engineering, provide services with minimal Union Parishad involvement, and there is no union-wise citizen list. This complicates identifying deserving individuals, leading to some households receiving multiple benefits while others are excluded, thus impeding resource allocation. Data dependency extends further up the hierarchy, with the Union Parishad sometimes relying on the district DC for data validation. This dynamic of vertical relationships is illustrated by a statement from a key informant in Kumira Union:

For warisan and succession certificate, if the age of the child is more than five (5) years, the attestation should be done by the Deputy

Commissioner of the district. Therefore, we lack this data; most of the citizens cannot provide this document when we want to make the list of legal warisan (KI, Kumira Union Digital Centre).

Based on the aforementioned quote, it becomes evident that Union Digital Centre (UDC) experience challenges in delivering essential services due to insufficient data. Even in some cases, the KIs from Union Parishad indicated that during emergencies, they are dependent on DC or UNO for the service delivery instructions and documentation. For example, during climate related emergencies, Union Parishad cannot take any immediate actions until it is instructed by the DC or UNO. Owing to this time delay, individuals experience difficulties, and valuable resources are lost.

In case of land service, one of our KIs from Khesra Union Land Office suggested that the authority of the land mutation service should be devolved to the Union Land Office:

If the service delivery mechanisms can be made easier, it could attract more citizens. Particularly, the 'Mutation' (Namjari) service. Currently, it requires to be applied through AC Land. If this service can be devolved to the Union Land Office, I think it could be easier for the citizens and more of them could apply for this service (KI, Union Land Office, Khesra).

This interdependence is also evident in other transferred departments at both the Union and Upazila levels. For example, the Agriculture Information and Consultation Centre at the Union level relies on the Upazila Agricultural Extension Department for collecting service delivery-related information, instructions, and resources. In response to this challenge, departments at the Union level

recommend transitioning service delivery mechanisms to that level, thereby conferring a specific degree of decision-making authority.

Based on the quotes and discussions above, it becomes apparent that the current horizontal and vertical data dependency contributes to delays in Union-level service delivery by the Government Organizations. As highlighted by the key informants in this study, effective devolution of services to Union-level offices would not only streamline the system but also attract more citizens, resulting in a visible increase in the number of development service recipients. In the current context of enhanced connectivity, a data hub can grant Union-level offices access to essential and dependable data for decision-making, while simultaneously allowing monitoring of their decisions by Upazila and District-level offices.

4.1.2 Non-Government Organizations

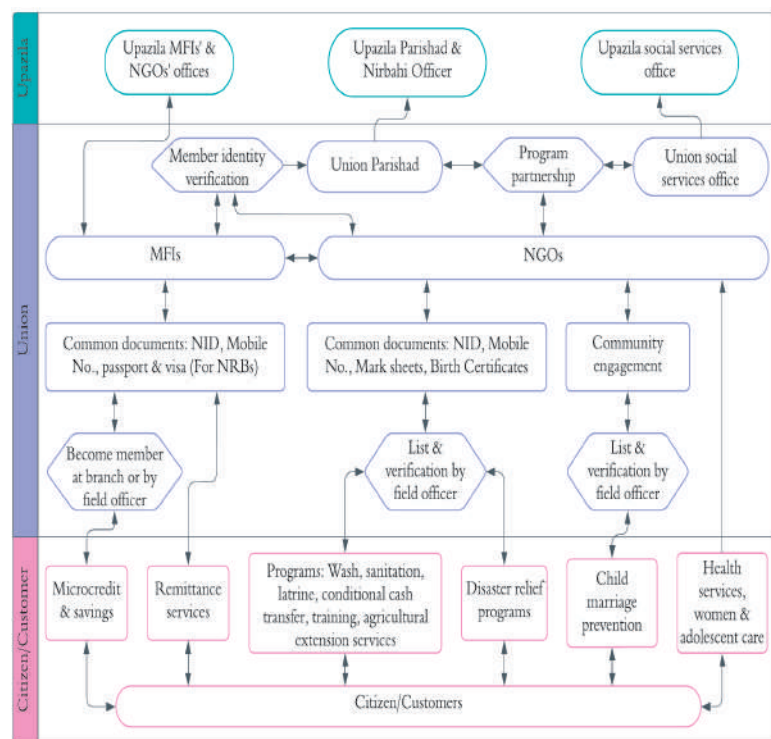
Similar to Government Organizations, Non-Government Organizations (NGOs) at the Union level recognize data dependency as a significant challenge in achieving effective and efficient delivery service. Analogous to Government Organizations, we have illustrated the horizontal and vertical data dependency relationships of NGOs in Figure 2. This depiction aligns with the structure seen in Figure 1.

We categorize NGO services into two segments: financial services and programs. For financial services, Micro Finance Institutions (MFIs) predominantly rely on the Union Parishad for members' identity verification. Conversely, when implementing programs, NGOs engage more extensively with both the Union Parishad and the Union social services office. KIs from local NGOs discussed how their programs rely on government offices for data support. In the present relationship structure, as exhibited in Figure 2, the absence of data-hub or dashboard

impedes the effective delivery of their services. One of the KIs from Tala Union shared:

Our NGO empowers women through training, microfinance, and job creation programs. We often rely on the Union Parishad for accurate information on marginalized women. Despite having field officers, we need verification from the Union Parishad, but obtaining this information can be challenging, making it hard to identify women who receive multiple NGO loans and those excluded from our services (KI, Women Job Creation Centre, Tala Union).

Figure 2. Data dependency relationship of the NGOs



Note: This flowchart is drawn based on the KIs' interview.

This indicates that, in many cases, the union level NGOs frequently rely on Union Parishad and other Government Organizations for accurate data. Based on our field observations, it appears that local NGOs encounter challenges getting cooperation from elected representatives of the Union Parishad and other government offices. Therefore, most of the KIs highlighted the importance of a 'collaborative partnership' between GOs and NGOs to address this challenge. For instance, one of the KIs from Tala Union shared:

Our NGO empowers the 'Dalits' in Tala union. To include them in the government's social safety net, timely information from Upazila Social Service and Youth Development offices is crucial. We need cooperation from the Union Parishad and Upazila offices regarding government allocations for this community (KI, Uddipto Mahila Unnayan Shangstha, Tala Union).

KIs also underscored the presence of data dependency relationships across various NGOs. During discussions on this topic, a majority of the KIs advocated for a collaborative approach to data sharing, especially among NGOs that offer comparable services. They believe that such collaboration can enhance efficiency, streamline service delivery, and ultimately benefit the communities they serve. Our participants described how collaborative data sharing among NGOs can be effective in selecting the most suitable beneficiary:

Our NGO focuses on loans and microfinance. Many borrowers receive loans from multiple NGOs, but without a shared database, we lack information on these borrowers. Sharing borrower data among NGOs would greatly improve our services and positively affect a larger population (KI, Nobolok Parishad, Kumira Union).

This particular issue is consistently emphasized by all the KIs from the MFIs. In numerous cases, borrowers obtain loans from multiple MFIs at the same time. As there is no Credit Information Bureau (CIB) or similar data sharing service for MFIs, it is difficult to end this practice. Furthermore, at the Union or Upazila level, there is no centralized record-keeping service. If there is a data-hub or dashboard, MFIs could easily check borrowers' profile, which eventually helped them to reduce their bad debts and enhance sustainability.

4.2 Power Dynamics

Since its inception, the local government bodies in Bangladesh, particularly Union Parishad, have been limited to certain development functions within their jurisdiction. Historically, local government bodies lack authority to exert control over regulatory governance (Lewis & Hossain, 2018; Uddin, 2019a; Waheduzzaman & Alam, 2015). Different transferred departments of the central government regulate various development activities that are within the jurisdiction of the Union Parishad. Consequently, the existing legal framework limits the authority and decision-making capacity of local government bodies at the union-level when it comes to implementing central government's development initiatives (Panday, 2017).

Our research reveals similar discernible power dynamics. According to our findings, in numerous instances, both funding allocation and decision-making authority reside with the Upazila administration. Even when Union-level service providers have access to relevant data, they lack decision-making autonomy. Ultimately, decisions rest with the central administration operating at the Upazila level. One of our KIs highlighted this power dynamic, specifically in relation to social safety net programs:

To be listed in social safety net programs, citizens first apply online for required documents, which are verified by ward members. The final list of beneficiaries depends on the central government's budget allocation, as communicated by the UNO to the Union Parishad chairman. (KI, Union Parishad, Tala).

Based on the quotation provided, it is evident that while the Union Parishad bears the responsibility of identifying potential beneficiaries for social safety net programs, they lack decision-making authority concerning the finalization of beneficiary lists and budget allocation within their locality. Another example is the old age allowances. The Union Parishad is only given the authority of collecting and verifying the required documents for this service and distribute the allowance among the selected recipients. One of our KIs from Union level described the process of distributing old age allowance and thus highlight the power dynamics operating in this process:

The old age allowance process involves document verification by ward members, the Union Parishad Chairman, and the village police. Online applications are also verified by ward members and the Chairman. The final list relies on the UNO and Upazila Social Service Office. Once prepared, recipients apply online for the allowance card, which is then distributed by the Union Parishad. (KI, Union Parishad, Kumira).

Even though the power hierarchy is not clear from the above quote, our observation based on the earlier studies (Khan, 2008; Uddin, 2019a, 2019b) suggests that, in many cases, the union level transferred departments are not given the decision-making authority even though they have their own finances. Instead, the decision-making authority is given to the representative of the central administration

(UNO in this particular case). Another aspect of power dynamic was shared by one of the KIs from the union level NGO. They discussed the reasons of why and how, in some cases, their decisions are interfered and influenced by the local level political elites:

Local level political influence often causes difficulties in the fair selection of young unemployed trainees and loan recipients. Due to this political influence, sometimes we are forced to list the disqualified candidates. In many cases, these candidates do not repay the loans as they have political power in their locality. In order to deliver our services fairly, the UP chairman and the ward members should not be biased to the political power; they should keep a neutral stance (KI, Tala Union Youth Development).

The above quote implies that the locally elected representatives must not be subjected to pressure by the local level political elites in order to ensure just and equitable service provisions at the union level. Overall, the findings in this subsection echoed with the earlier studies that local level decision making authority is not devolved to the local government institutions at the union-level and these institutions are under constant authority of the Upazila and District level administration and local level political power.

4.3 Systemic Barriers of Decentralized Service Delivery

This subsection discusses some of the institutional practices, policies and procedures that hinders decentralization at the Union level. This study's overarching goal is to understand the significance of a data hub for decentralized governance; therefore the systemic barriers we point out are particularly pertinent to data.

Drawing on the Key informant interviews, this study highlights the institutional barriers related to mobile banking, data unavailability, inefficient storage of data, lack of timely data, and absence of data sharing culture of union-level local government institutions.

4.3.1 Mobile Banking Related Problems

The government places significant emphasis on mobile banking services for allowance distribution. However, it is common for recipients to lack personal mobile phones, leading them to provide others' phone numbers. Unfortunately, there is currently no system in place to verify the ownership of the phone numbers provided. Consequently, this situation can result in the misappropriation of funds. One of the KIs suggested (mentioned below) for having a mobile number verification portal. They also suggest including a cash counter to receive allowance. To provide allowance at the nearest point, agents of Mobile Financial Services (MFS) can be used as a cash counter. Given that the government already possesses biometric information for a citizen, MFS agents can accurately disburse funds through fingerprint verification. A similar facility is already operational for selling mobile SIM cards. By enabling data sharing among relevant departments, the government can ensure accurate and efficient allowance distribution to recipients:

People receiving allowances via mobile banking often use accounts set up on their relatives' phones, causing many to miss payments due to outdated data or lack of mobile service use. Checking if numbers are registered in beneficiaries' names and cash accounts are started could improve this issue, as many report missing or stolen money (KI, Tala Union Parishad).

4.3.2 Data Unavailability

At the Union level, the absence of relevant and accurate data impedes effective and decentralized service provisions. KIs from union-level NGO have observed a lack of pertinent and precise data. In many cases, the service recipients provide inaccurate documents to be included in the development beneficiary list. Consequently, local-level NGOs struggle to correctly identify the intended beneficiaries. KIs also shared their experiences of relying on the elected Chairman or Members of Union Parishad to make the list of beneficiaries. In many cases, they do not provide accurate information as well. One of the KIs described this challenge as:

For old age allowance, it is difficult to list which elderly person in the village is not covered by this program. The list is based on the word of mouth from local Union members. For this reason, sometimes, the correct information is not available to us (KI, Satkhira Unnayan Shangstha, Tala Union).

Another data-related issue has been identified by a KI. They shared their experiences in delivering medical treatment to local patients, highlighting the patients' reluctance to provide accurate information and the challenges associated with it:

Most of our patients cannot accurately remember their mobile numbers. Since we do not have their contact numbers, we cannot provide them with follow-up services. Sometimes when these patients visit us for another service, they do not bring the previous medical history. In some cases, they lose those papers; so, we fail to provide the treatment (KI, Jagodanondakati Community Clinic, Kumira Union).

When our research team inquired about potential solutions, the interviewee recommended for a data hub which will support them with accessible and convenient process of getting relevant information:

A unique identifier allows easy access to patient information and medical history. To enhance service delivery, we need immediate access to patients' profiles, including personal and medical data, which should be conveniently accessible with a single click (KI, Jagodanondakati Community Clinic, Kumira Union).

The aforementioned evidence underscores the scarcity of relevant and accurate data, along with the attendant challenges in delivering responsive services. Consequently, urgent action is warranted to establish a data hub.

4.3.3 Manual Storage of Data

In case of service delivery, another recurring challenge is inefficient storage of data. In interviews, when KIs were questioned about whether data scarcity posed a primary systemic challenge in service delivery, the majority of respondents indicated that the existing data is adequate for service provision. However, the long-standing practice of manually storing and service delivery with outdated data is recognized as the primary obstacle. For instance, most of our KIs shared that they directly collect the information from the service recipients during the time-of-service delivery and then store all those data in a locked 'Almirah' (Cupboard). They also shared that there is no practice of updating the data. One of the KIs shared their dissatisfaction with this manual process of collecting and storing data:

In the case of pregnant women, we collect data on their name, age, address, weight, blood

pressure, gestational age, when the period has stopped etc. We also provide them iron tablets, folic acid and vitamin B complex tablets. All these data are recorded in the register and stored in a locked cupboard (KI, Health and Family Planning Centre, Tala Union).

Due to this manual system, informed service delivery requires more time which is shared by one of the KIs:

This is not the case that we lack data, but the problem is everything has to be saved manually as before. Since the manual registers are stored in a cupboard along with a pile of other data, we cannot easily show it to the citizens. It takes time to find those registers (KI, Kumira Post Office).

The aforementioned quotations, in conjunction with our direct observations during fieldwork and rigorous data analysis, emphasize a critical imperative: alongside the essential technical infrastructure of a data hub for decentralized service delivery, there must be a fundamental transformation in organizational practices. This transformation should prioritize timely data updates, secure storage protocols, and a steadfast commitment to data-driven decision-making.

4.3.4 Poor Inventory Management

Another challenge in service delivery is ineffective inventory management which is evident from our KI interviews. Our KI from Union Family Planning and Health Centre shared:

This is not the case that we lack data for effective service-delivery, but we lack family planning supplies. Due to the supply of injections being less than the requirement, citizens have to return home without receiving this service (KI, Health and Family Planning Centre, Kumira Union).

Timely data is critical in effective inventory management. Real-time updates provide accurate insights into stock levels, demand fluctuations, and supply chain dynamics. By leveraging data hub, GOs and NGOs can make informed decisions, reduce errors, and respond swiftly to market changes.

4.3.5 Lack of Coordination in Data Sharing

As described briefly in Subsection 4.1, our interview findings revealed a lack of data coordination among organizations offering similar services. While both GOs and NGOs at the Union level have amassed substantial data, there is a notable absence of concerted efforts to share this information within the organizational landscape. Consequently, we observe redundancy, with multiple service providers collecting, validating, and storing identical documents from service recipients.

In the Tala Union, organizations providing financial support, such as loans and microfinance, collect comprehensive data from citizens. This includes details such as names, ages, national ID cards, photos, birth certificates, income certificates, trade licenses, and mobile numbers. Often, these documents undergo verification through the Union Parishad. Our study reveals that some of these documents are already verified, supporting the identification of potential social safety net recipients and facilitating other service delivery tasks. However, due to a lack of coordination among union-level organizations in data sharing, the citizens are required to verify their documents redundantly. This redundancy not only increases the hassle for a citizen but also places additional pressure on the Union Parishad. A similar systemic barrier and the potential solution is also described by one of our respondents working in the transferred department at the Union level:

If there is coordination among the Union Parishad, Upazila Sub-registrar office and District level land record office for the verification of inheritance certificate, it would be easier to verify and register the land related documents (KI, Tala Union Land Office).

The evidence indicates that there is a huge possibility to enhance efficiency and deliver timely service through improving the coordination of data. For this purpose, a data-hub can be highly effective in coordinating the data among the service delivery departments.

5 Conclusion

This study examined the power dynamics, systemic barriers, and institutional interdependencies (both vertical and horizontal) within Union Parishads to assess the potentials and challenges of data-driven service delivery. Drawing on key informant interviews, the study identified several critical findings: (i) data dependency among government organizations (GOs) and non-governmental organizations (NGOs) significantly impedes decentralized decision-making; (ii) Union Parishads lack sufficient authority to act on data, resulting in delays and inefficiencies; and (iii) systemic barriers such as data unavailability, manual storage practices, outdated records, poor coordination in data sharing, and resource constraints further undermine service responsiveness. Additionally, the study revealed that the experiential knowledge of grassroots staff is often excluded from formal decision-making processes, highlighting the need for institutional mechanisms to integrate field-level insights into service design.

To address these challenges, the study proposes a dual policy approach: first, the establishment of a union-level data hub to centralize and streamline data collection, storage, and sharing; and second, the decentralization of

service delivery authority to empower Union Parishads with both operational and financial autonomy. Specific policy recommendations include transferring services such as land mutation to Union Land Offices, creating a Credit Information Bureau for NGOs engaged in microfinance, and instituting centralized record-keeping systems to enhance transparency and coordination. These measures would enable more responsive, need-based service delivery at the local level.

This study contributes to the scholarly discourse on data governance and decentralized service delivery by applying systems mapping to reveal the complex interrelations among actors in a resource-constrained governance environment. It advances theoretical understanding of how institutional power asymmetries and data dependencies shape service outcomes in developing country contexts. For policymakers, the findings offer a strategic framework for reforming local governance in Bangladesh. By promoting financial autonomy, institutional capacity-building, and integrated data systems, the study provides actionable insights for designing data-driven service delivery models tailored to the realities of union-level governance. Future research should incorporate citizen perspectives to enrich the understanding of service delivery dynamics and further explore the interplay between data governance and decentralization in local government systems.

References

- Agbozo, E., & Spassov, K. (2018). Establishing efficient governance through data-driven e-government. Proceedings of the 11th international conference on theory and practice of electronic governance. Pages 662 – 664.
<https://doi.org/10.1145/3209415.3209419>
- Alhassan, I., Sammon, D., & Daly, M. (2016). Data governance activities: an analysis of literature. *Journal of Decision Systems*, 25(sup1), 64-75.
- Baroi, H. S., & Alam, S. (2021). Operationalizing the Right to Information Act through e-governance in Bangladesh: challenges and opportunities. *International Journal of Public Administration*, 44(8), 685-698.
- Begum, T., Khan, S. M., Adamou, B., Ferdous, J., Parvez, M. M., Islam, M. S., Kumkum, F. A., Rahman, A., & Anwar, I. (2020). Perceptions and experiences with district health information system software to collect and utilize health data in Bangladesh: a qualitative exploratory study. *BMC health services research*, 20, 1-13.
- Benfeldt, O., Persson, J. S., & Madsen, S. (2020). Data governance as a collective action problem. *Information Systems Frontiers*, 22, 299-313.
- Bibri, S. E. (2021). The underlying components of data-driven smart sustainable cities of the future: a case study approach to an applied theoretical framework. *European Journal of Futures Research*, 9(1), 13.
- Castro, C., & Lopes, C. (2022). Digital government and sustainable development. *Journal of the Knowledge Economy*, 13(2), 880-903.
- Cavill, N., Richardson, D., Faghy, M., Bussell, C., & Rutter, H. (2020). Using system mapping to help plan and implement city-wide action to promote physical activity. *Journal of public health research*, 9(3), 1759.
- Clarke, V., Braun, V., & Hayfield, N. (2015). Thematic analysis. *Qualitative psychology: A practical guide to research methods*, 222, 248.
- Cori, A., Donnelly, C. A., Dorigatti, I., Ferguson, N. M., Fraser, C., Garske, T., Jombart, T., Nedjati-Gilani, G., Nouvellet, P., & Riley, S. (2017). Key data for outbreak evaluation: building on the Ebola experience. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 372(1721), 20160371.
- Effah, J., & Nuhu, H. (2017). Institutional barriers to digitalization of government budgeting in developing countries: A case study of Ghana. *The Electronic Journal of Information Systems in Developing Countries*, 82(1), 1-17.
- Etang, A., & Himelein, K. (2020). Monitoring the Ebola crisis using mobile phone surveys. *Data collection in fragile states: Innovations from Africa and Beyond*, 15-31.
- Faezirad, M., & Khoshnevisan, A. (2023). Leveraging the Potential of Soft Systems Methodology to Trigger Data Governance Policymaking in the Banking Industry. *Journal of Systems Thinking in Practice*, 2(1), 56-70.
- Fernandez, S., & Rainey, H. G. (2017). Managing successful organizational changes in the public sector. *Public Administration Review*, 66(2):168-176. DOI: 10.1111/j.1540-6210.2006.00570.x

Gill, B., Borden, B. C., & Hallgren, K. (2014). A conceptual framework for data-driven decision making. *Mathematica Policy Research Reports*, c811d94086af410aa2cf67190

Hasan, A., Putri, E. R., Susanto, H., & Nuraini, N. (2022). Data-driven modeling and forecasting of COVID-19 outbreak for public policy making. *ISA transactions*, 124, 135-143.

Head, B. W. (2008). Three lenses of evidence based policy. *Australian Journal of Public Administration*, 67(1), 1-11.

Hossin, M. A., Du, J., Mu, L., & Asante, I. O. (2023). Big Data-Driven Public Policy Decisions: Transformation Toward Smart Governance. *Sage Open*, 13(4), 21582440231215123.

Huque, A. S., & Ferdous, J. (2024). Electronic public service delivery: progress and challenges in Bangladesh. *Public Administration and Policy*, 27(1), 19-30.

Khan, M. A. H., de Oliveira Cruz, V., & Azad, A. K. (2019). Bangladesh's digital health journey: reflections on a decade of quiet revolution. *WHO South-East Asia journal of public health*, 8(2), 71-76.

Khan, M. M. (2008). Functioning of local government (Union Parishad): Legal and practical constraints. *Democracy watch, RTI international, democratic local governance program-DLGP, USAID*.

Khan, N. (2016). Challenges and trends in decentralized local governance in Bangladesh. *Institute of South Asian Studies Working Paper*, 222, 1-19.

Leach, M. (2015). The Ebola crisis and post 2015 development. *Journal of International Development*, 27(6), 816-834.

Lewis, B. D. (2017). Does local government proliferation improve public service delivery? Evidence from Indonesia. *Journal of Urban Affairs*, 39(8), 1047-1065.

Lewis, D., & Hossain, A. (2018). Dealing with the local level power structure: findings from a qualitative study of three villages in Greater Faridpur District. *Journal of Bangladesh Studies*, 18(1-2).

Maffei, S., Leoni, F., & Villari, B. (2020). Data-driven anticipatory governance. Emerging scenarios in data for policy practices. *Policy Design and Practice*, 3(2), 123-134.

Matheus, R., Janssen, M., & Maheshwari, D. (2020). Data science empowering the public: Data-driven dashboards for transparent and accountable decision-making in smart cities. *Government Information Quarterly*, 37(3), 101284.

Micheli, M., Ponti, M., Craglia, M., & Berti Suman, A. (2020). Emerging models of data governance in the age of datafication. *Big data & society*, 7(2), 2053951720948087.

Misuraca, G., Barcevicius, E., & Codagnone, C. (2020). Exploring Digital Government Transformation in the EU—Understanding public sector innovation in a data-driven society. No JRC121548, *JRC Research Reports* from Joint Research Centre. <https://publications.jrc.ec.europa.eu/repository/handle/JRC121548>

- Osah, J., & Pade-Khene, C. (2020). E-government strategy formulation in resource-constrained local government in South Africa. *Journal of Information Technology & Politics*, 17(4), 426-451.
- Ospina, S. M., Esteve, M., & Lee, S. (2018). Assessing qualitative studies in public administration research. *Public Administration Review*, 78(4), 593-605.
- Panday, P. (2017). Decentralisation without decentralization: Bangladesh's failed attempt to transfer power from the central government to local governments. *Asia Pacific Journal of Public Administration*, 39(3), 177-188.
- Panday, P. K. (2011). Local government system in Bangladesh: How far is it decentralized? *Lex Localis: Journal of Local Self-Government*, 9(3).
- Pomeroy-Stevens, A., Goldman, B., & Grattan, K. (2022). Participatory systems mapping for municipal prioritization and planning. *Journal of Urban Health*, 99(4), 738-748.
- Ros, F., Kush, R.D., Friedman, C.P., Gil Zorzo, E., Rivero Corte, P., Rubin, J.C., Sanchez, B., Stocco, P., & Van Houweling, D. (2020). Addressing the Covid 19 pandemic and future public health challenges through global collaboration and a data driven systems approach. *Learning Health Systems*, 5.
- Ruijter, E. (2021). Designing and implementing data collaboratives: A governance perspective. *Government Information Quarterly*, 38(4), 101612.
- Sayogo, D. S., Yuli, S. B. C., & Amalia, F. A. (2023). A Critical Success Factors for Data-Driven Decision-Making at Local Government: The Case of Indonesia. *JeDEM – E-Journal of E-Democracy and Open Government*, 15(2), 148–166. <https://jedem.org/index.php/jedem/article/view/766>

- Shibambu, B. A. (2019). *Digital curation of records in the cloud to support e-government services in South Africa* University of South Africa Pretoria. [Published Ph.D. Dissertation, University of South Africa].
- Starnini, M., Aleta, A., Tizzoni, M., & Moreno, Y. (2021). Impact of data accuracy on the evaluation of COVID-19 mitigation policies. *Data & Policy*, 3, e28. doi:10.1017/dap.2021.25
- Storm, M.H., & Borgman, H.P. (2020). Understanding Challenges and Success Factors in Creating a Data-Driven Culture. *Hawaii International Conference on System Sciences*.
- Taylor, G. A. J., & Blake, B. J. (2015). Key informant interviews and focus groups. *M. De Chesnay (Ed.), Nursing research using data analysis: Qualitative designs and methods in nursing*, 153-165. Springer Publishing Company, New York.
- Terry, G., Hayfield, N., Clarke, V., & Braun, V. (2017). Thematic analysis. *The SAGE handbook of qualitative research in psychology*, 2, 17-37.
- Uddin, N. (2019a). Empowerment through participation in local governance: the case of Union Parishad in Bangladesh. *Public Administration and Policy*, 22(1), 40-54.
- Uddin, N. (2019b). Inquiring Autonomy of Local Governance in Bangladesh: The Case of Union Parishad. *Dynamics of Public Administration*, 36(1), 47-56.
- van Ooijen, C., Ubaldi, B., & Welby, B. (2019). A data-driven public sector: Enabling the strategic use of data for productive, inclusive and trustworthy governance. OECD Working Papers on Public Governance 33, OECD Publishing.

- Veenstra, A., & Kotterink, B. (2017). Data-driven policy making: The policy lab approach. 9th International Conference Electronic Participation (ePart), September 4-7, 2017, St. Petersburg, Russia, pp.100-111, Proceedings 9. [10.1007/978-3-319-64322-9_9](https://doi.org/10.1007/978-3-319-64322-9_9). [hal-01703333](https://hal.archives-ouvertes.fr/hal-01703333)
- Vitálišová, K., Murray-Svidrová, M., & Jakuš-Muthová, N. (2021). Stakeholder participation in local governance as a key to local strategic development. *Cities*, 118, 103363.
- Waheduzzaman, W., & Alam, Q. (2015). Democratic culture and participatory local governance in Bangladesh. *Local Government Studies*, 41(2), 260-279.
- Weng, S. F., Reys, J., Kai, J., Garibaldi, J. M., & Qureshi, N. (2017). Can machine-learning improve cardiovascular risk prediction using routine clinical data? *PloS one*, 12(4), e0174944.