Foundation for Responsive Governance

Working Paper

# Street-Level Tech: The Role of Data Entry Operators in India's Welfare Infrastructure


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## Abstract

The Indian state has rapidly digitised welfare governance delivery in the last two decades with platforms now providing a wide range of services. This digitisation has produced a new cadre of street-level officers – the Data Entry Operator (DEO). DEOs are classified as support staff and are yet the sole actors in charge of operating digital systems. They collect registration forms, enter details online and ensure the data is verified. They serve as the first desk a citizen approaches during their visit to the Gram Panchayat (GP) office and conduct field visits too. Despite their importance, their roles remain underexamined in academic literature.

This paper draws on fieldwork across five states - Bihar, Madhya Pradesh, Rajasthan, Maharashtra, and Himachal Pradesh – and over 100 officers, to examine their backgrounds, responsibilities and everyday challenges. We argue that DEOs form a new technocratic, contractual class essential to digital governance. They are responsible for managing complex systems, interacting with citizens and navigating overlapping administrative expectations - all while lacking formal recognition and support. We demonstrate how DEOs do not reduce discretion at the frontline, but reshape it. DEOs offer a compelling entry point into the conversation on the role of digital technologies in governance and the humans behind them.

## Key words

Street-level bureaucracy, digital governance, technological ambition, human capability

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# TABLE OF CONTENTS

# Introduction

Over the last two decades the Indian state has observed a rapid uptake in digital technology, particularly in the delivery of welfare services. **From employment and housing to health and education, digital platforms now mediate almost every aspect of public provisioning.** This includes digitising documentation to using artificial intelligence in everyday governance.

These reforms are not only technological but institutional, altering the way in which the state operates, how it is staffed and how it engages with citizens. **One less visible but important change is the introduction of a new kind of street-level bureaucrat: the Data Entry Operator (DEO).**

DEOs have become integral to the implementation of flagship welfare programmes such as the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and the Pradhan Mantri Awas Yojana-Gramin (PMAY-G). Stationed across 250,0000 Gram Panchayat offices across the country, they serve as the digital interface of the rural state.

Yet, while there is considerable scholarly attention on the digital turn in Indian governance, the role of DEOs remains underexplored. Who are they? What do they do? How do they manage their everyday work within an increasingly digital and hierarchical system?

This paper draws on empirical research conducted across five Indian states namely **Bihar, Madhya Pradesh, Rajasthan, Maharashtra, and Himachal Pradesh** between October and December 2022. Drawing on interviews with **86 DEOs, 12 Management Information System (MIS) officers that they report to, and 4 Block Development Officers (BDOs),** this study provides a grounded account of how DEOs navigate the digital bureaucracy, highlighting their backgrounds, training, responsibilities, and the challenges they face.

To ground our analysis, our interviews focussed on the practice of two large welfare schemes, MGNREGS and PMAY-G. The schemes were chosen as they provide variance between a scheme that has gradually introduced digitisation and a scheme that was launched with embedded digital elements.

**We argue that DEOs represent a new cadre of contractual, technocratic bureaucrats who, despite being relatively lower down in official hierarchies, are indispensable to the functioning of India's digital welfare state. By examining their work, we illuminate the gaps between policy design and implementation, between technological ambition and human capability, and between formal accountability structures and the lived realities of governance.**

The paper is structured as follows: we begin by situating the DEO within broader scholarship on street-level bureaucracy and digital governance. We then characterise the typical DEO looking at their demographic and educational and work experience. This is followed by delving into their everyday learning practices, rule-bending behaviour, and the structural ambiguities they contend with. We conclude by reflecting on why DEOs matter for both research and policy, especially in imagining more responsive and equitable digital governance systems and present propositions on further research needed in this area.

# Street-Level Bureaucracy and Digital Governance

With the proliferation of systems such as Aadhaar, Direct Benefit Transfers, Management Information Systems for schemes, digital governance has emerged as a central paradigm in the delivery of public services in India. Done with a view to reduce inefficiencies, eliminate leakages, and increase transparency, these digital technologies are often presented by the state as a move towards a more automated and accountable form of governance (Digital India Programme, 2025).

**However, the ground reality is that digital technologies often require human intermediaries to function—individuals responsible for inputting, verifying, and navigating complex administrative platforms.**

Michael Lipsky (1980), in his foundational theory of street-level bureaucracy, emphasised the discretion and autonomy required of frontline officials who interact directly with citizens. While Lipsky's framework emerged in the context of industrialised democracies, it remains relevant in understanding governance in India. Seeing it in the context of the DEOs, **it is clear that digital systems have not eliminated discretion but have reshaped its exercise—embedding it within new roles such as those of the DEOs.** This, we observe, is consistent with the "enablement hypothesis" that demonstrates how street-level bureaucrats continue to exercise discretion by finding loopholes in the ambiguous rules governing large welfare outcomes (Alshallaqi 2022; Pollit 2011). Further, **subordinate-supervisor relationships have an effect on how this enablement thesis plays out in everyday governance.**

Service delivery in India today may have moved from the traditional system of field officers, clerks, and the infamous government files with notings to one characterised by biometric authentication, dashboards and databases. Yet, these technologies still depend on human judgment and mediation. As essential gatekeepers, **DEOs bridge the gap between policy and action, converting government directives into actionable data and ensuring that this data translates into tangible benefits for citizens.**

Existing literature on India's digital governance, however, has focused on systemic outcomes—efficiency, inclusion, or exclusion—rather than the actors who operate the systems (Grace and De Neve, 2021; Masiero, 2016). Studies have explored how citizens are affected by digital divides, but far less attention has been paid to the bureaucrats who navigate these divides on behalf of the state (Zerah, 2020; Mathur, 2016; Veeraraghavan, 2015).

By bringing the DEO into the discussion, this paper contributes to an emerging body of scholarship that argues for a closer examination of the everyday practices of bureaucrats in the digital age. Their everyday actions influence both the use of technology and the extent to which governance is experienced by citizens.

# Who are Data Entry Operators?

It is difficult to enter a Gram Panchayat (GP)or block office today without encountering a DEO. As their title suggests, they are officially responsible for collecting, scrutinising and entering data on different services and schemes and facilitating access to welfare services. However, their actual role far exceeds one of simple data entry. To understand this cadre fully, it is useful to understand who occupies these positions, how they are recruited, trained, and their motivations for joining the state.

Most DEOs in our study were young, usually in their mid-20s to early 40s. While the survey did not collect precise age data, according to field interviews, **the majority were young adults who had just finished their formal schooling and were drawn to government work as a way to secure stable income and social mobility.**

**Gender representation among sampled DEOs was relatively balanced.** For many women, especially where few alternative work options existed, the DEO post was a unique chance for both financial independence and fulfilling involvement outside the house. As one Gram Rozgar Sevak in Rajasthan, now working as a DEO shared:

> *" I wanted to work but as a woman, there are limited opportunities in the village. This job was one of the only options available for me "*
>
> (Interview #33, October 22nd, 2022)

**Academic qualifications among DEOs are uniformly high for the nature of the job.** All DEOs interviewed had completed at least an undergraduate degree, with 29% holding postgraduate degrees. Their academic backgrounds varied and ranged from management sciences, finance and accounting, and social sciences. While the core proficiency required was basic computer operations, this diversity suggests that the role attracts candidates with a broad range of interests and competencies.

Prior work experience among DEOs is less uniform. Many enter the role directly after completing their education, while others have held temporary or informal jobs in the private sector, local businesses, or as volunteers in community organisations. **The transition to government service is often motivated by the perceived stability and prestige of a "sarkari naukri" (government job), as well as the scarcity of alternative employment opportunities in their localities.** For women, in particular, as previously mentioned, the job is seen as a pathway to economic empowerment and social recognition.

Recruitment and selection practices varied across states with some states hiring directly while others through a local hiring agency. In states like Rajasthan where Gram Rozgar Sahayak positions were converted to permanent positions, many were given promotions to become DEOs. Even so, employment remained precarious - most DEOs had contractual fixed term contracts, with limited guarantees of renewal or promotions.

As mandated for the role, **all DEOs completed certification courses in computer management,** usually provided or subsidised by the state government. This included training in automation systems and typing proficiency. The duration and depth of training, however, varied from state to state. In many states, pre-service training lasted one day; in Himachal Pradesh it extended to two days. Training was typically delivered by block level functionaries such as Block MIS officers or the Block Development officer. In Rajasthan, it was conducted at the district level by the District Magistrate's office. The curriculum covered topics such as the structure and functioning of the panchayat, the specifics of welfare schemes being implemented, the rules and procedures of data entry, and penalties for misappropriation or data entry errors.

**Notably, there is no provision for in-service training, meaning that DEOs had to learn and adapt to new rules and technologies on their own.** As an officer in Rajasthan shared:

> *"I learnt only 15 per cent of the job during the training… and the remaining 85 per cent I learnt as I did the job these last 10 years. Schemes change and so do the rules, which we learn ourselves"*
>
> (Interview #27, November 17th, 2022).

Within the bureaucratic structure, DEOs occupy a unique and in some ways paradoxical position. While technically classified as support staff and placed in either the Gram Panchayat office or block office, depending on the administrative requirements of the specific scheme, **they are often the sole actors capable of operating digital systems central for welfare delivery**. Their work spans collecting scheme registration forms, entering details of recipients into the MIS and ensuring that data is accurate and up to date for multiple schemes. Despite their pivotal role, they remain side lined from key decision-making roles and often subordinate to multiple supervisors, ranging from their immediate superior (such as the BDO at the block office or the Panchayat Secretary at the Gram Panchayat), elected representatives (like the Sarpanch), and technical specialists (such as the MIS Officer). This is discussed in detail in the next section.

**In conclusion, DEOs are highly educated, technologically skilled and predominantly contractual workers whose professional identity is shaped by both the demands of an increasingly digitising bureaucracy and the institutional ambiguity in which they are embedded.**

# Unpacking a Data Entry Operator's Tasks

While the designation of "Data Entry Operator" denotes a relatively narrow, technical function, in practice, the work of a DEO spans a broad range of often unpredictable responsibilities. Their tasks interact not just with digital data systems but also with field logistics and citizen problem solving. This section outlines how the everyday practices of how DEOs carry out their work.

A typical day of a DEO consists of entering beneficiary data into welfare scheme portals, verifying documents, resolving technical issues, and responding to citizen queries. Many DEOs also conduct field visits both for schemes such as PMAY-G which requires geotagging of assets but also to the block or district offices to resolve sticky queries or to attend training sessions. These visits often take place during the workday which takes a significant portion of their time away from the desk depending on the distance of the GP to the block office and the nature of the training session.

**DEOs are also often the first point of contact for citizens who are visiting GP offices.** Citizens seeking information about pending payments, registration status or application rejections often approach the DEOs for clarifications. This transforms their role from a techno-managerial support staff to one directly responsible for addressing citizen grievances. In addition to scheme specific work, DEOs handle administrative functions such as filing taxes, updating records, resolving system outrages and responding to demands from the block or district office.

While on paper DEOs are expected to identify invalid data or other errors, they do not do this in practice as they believe it is the job of their superiors or that of the automation features of the MIS to identify the errors. In some cases, instead of DEOs, Lower Division Clerks (LDCs) conduct data entry and visit PMAY-G eligible households and MGNREGS labour sites. In this case, DEOs interaction with citizens happens when citizens visit the block or Gram Panchayat office

Importantly, **all DEOs we interviewed shared that they did not expect the range of tasks prior to applying for the job.** They were aware of the data entry aspect but not of the citizen-facing grievance redress or block visits that constitute a significant part of their work.

# Blurred Accountability and Structural Ambiguity

Their unique role - on the one hand as support staff with limited discretion but on the other, responsible for executing varied tasks, even beyond their official mandate, gives rise to a diffused and complex system of accountability - spread across multiple supervisors, schemes, and layers.

DEOs report to several actors. For instance, we mapped that DEOs report to the following officers:

| Superiors within the GP office | Elected representatives | Technical specialists at the block or district | Line department superiors |
|---|---|---|---|
| for regular reporting on a daily basis | for reporting on schemes that require approvals | for technological support | for specific tasks on schemes |

Each of these actors may issue multiple directives usually with strict and short timelines, making prioritisation a challenge in their everyday work. For instance, while the BDO may prioritise submitting data for construction status of houses under PMAY-G, the Panchayat Secretary may demand immediate attention for a field visit where a disgruntled citizen awaits clarity on whether they qualify for the same scheme. **With no clear hierarchy of authority and lack of structured work planning, DEOs must constantly negotiate and renegotiate task priorities.**

**This complex and fragmented reporting structure with poor communication between different officers leads to delays, confusion and overwork.** All DEOs shared that they work longer hours than their colleagues to meet deadlines. As a DEO in Maharashtra shared:

> *"the workload for this job has become so much... Some work is assigned from the district, some work is assigned by the BDO and others from the GP. The work is so much that we don't know what we should give priority to. Everyone who is giving work feels that my work should be done first and they do not understand that there is only one person to do the work"*
>
> (Interview #67, October 7th, 2022).

**The introduction of digital technology to complete work exacerbates this ambiguity.** While MIS systems track scheme progress - such as number of citizen applications filed, number of people that received their wages/payments - they rarely capture in detail who is responsible for each task or how work is allocated. In effect, the current system monitors what is done but now how and who does it and who bears the burden. This weakens accountability as it is difficult to trace when errors or where gaps occur.

Moreover, since DEOs work in the interface of technical systems and political institutions, they are particularly vulnerable. **Their contractual position often makes it risky for them to push back against unfair demands or increased workload. In fact, our interviews found significant apathy from their supervisors regarding their position.** All BDOs interviewed did not perceive the challenges of the DEO as legitimate. Panchayat Secretaries at the Gram Panchayat offices expressed the same apathy.

Ultimately, the DEO's ambiguous position reflects a broader systemic contradiction in India's digital welfare state. **While introduction of technology promises increased transparency and accountability, they rely on a workforce that is under-recognised and insufficiently supported.** Without clear lines of responsibility and communication, accountability in practice gets passed between platforms and individuals.

# Dependence on Informal Pathways to Learn

As previously mentioned, DEOs receive minimal formal training. Even the training that is offered is focused on procedural overviews - how to operate the MIS system, enter data, etc and rarely covers broader topics like administrative workflows, social challenges a DEO may face or how to interact with citizens. **All DEOs we interviewed shared that the technical knowledge and skills that they required were acquired by them prior to joining the job.**

In the absence of structured and ongoing professional development, **DEOs shared that they depended heavily on informal networks to learn aspects such as these.** They would form WhatsApp groups of all DEOs in the block or district and constantly remain connected to learn about advancements in technology that would affect them. Many shared that they would reach out regularly to their counterparts to learn about how they could navigate challenges which sometimes also required field visits. Features like AnyDesk, where an individual can access another's mirrored screengrab, would be used routinely to solve challenges - a process that poses many risks on sensitive government data.

This reliance on informal learning not just encourages a culture of mutual support but also normalises improvisation and *"juggad"* as necessary strategies in a rapidly digital ecosystem. **DEOs have thus had to learn to complete their work faster through hacks and tricks that often involve subverting rules and procedures**. These were learnt faster on the job as they gained experience, an understanding we arrived at when analysing how DEOs who had spent longer periods of time in the role were quicker to share about these networks than those who had just joined the job. Experienced DEOs often became informal mentors to newer recruits.

**It is within these informal spaces that DEOs learn to navigate the discretionary aspects of their role – that is, those outside their job charts.** This includes knowledge on policies and procedures, skills with respect to time management, communication, and the abilities they require such as multitasking, collaboration, adaptability, working under pressure and following instructions. As such, learning for DEOs is not just a technical exercise but also one where tacit knowledge is gained about power dynamics, negotiation, managing citizen expectation and moral decisions involved in rule bending for what they perceive as public good.

Accessing technology can come with myriad challenges, especially when systems are constantly changing as the needs of the government evolve. All DEOs we interviewed shared that capacity building sessions would be of great value for them, especially when delivered through the portals they use on a daily basis.

# Bending Rules and Discretion Amidst Digital Transformation

A core principle of digital governance has been the reduction of bureaucratic discretion. Multiple checks are introduced to curtail bureaucratic discretion which would otherwise allow for biased decision making (Buffat, 2015). These include, and are not limited to, extensive rules and regulations followed by locks in making changes to systems. The tech logic here is to ensure bureaucrats at different levels had varying levels of discretion that they would exercise with caution apropos to their rank in the system. By automating workflows, payments and verification, digital systems constrain the ability of frontline workers to deviate from the process and use patronage to grant favours (Buffat, 2015).

**However, our fieldwork revealed that discretion has not disappeared - it has merely shifted to new forms.** DEOs, far from being bound to rules and automations, do exercise judgement and flexibility in navigating their roles. Most DEOs shared that the rules were ambiguous and not set in stone. Few could point to specific sources where their responsibilities or rules were mentioned, either in policy guidelines or manuals or even in digital portals.

**DEOs also shared that rule breaking did not have major consequences.** They could highlight consequences such as receiving notices for malpractice from the government but could not identify any DEO who had lost their job due to this.

Most importantly, **DEOs did not view their actions as rule breaking but as necessary adaptations.** Three cases along a scheme implementation cycle illustrate this in more detail.

During registration of citizens: DEOs shared that they had to follow lists of eligible beneficiaries based on what the system would generate. Upon probing further we unpacked that DEOs upload lists of beneficiaries provided to them by elected representatives and senior GP officers. Here, they had an opportunity to modify the list further based on their preferences either to correct errors, accommodate deserving cases, or in some cases to serve personal or political interests.

Upon receiving scheme approvals: At this stage, DEOs could block implementation of the scheme by withholding information from beneficiaries or officials who were supporting them. On withholding information, the DEO could engage in rent extraction for their own interests.

During verification: Digital technologies such as MISs would require the DEO to forward information to the head of the GP such as the Village Development Officer, Secretary or the Elected representative. At this stage, DEOs would use login IDs of these officials (with their consent) to approve applications. This practice was especially common when digital systems required multi-layered verifications but those officials were unavailable or non-cooperative. While technically a breach of protocol, DEOs framed these actions as pragmatic solutions to avoid delays in service delivery.

During our investigation, we understood that DEOs did not believe they were breaking rules, just bending them to ensure better implementation. **A moral justification of caring for the larger good would often follow when we probed the consequences of breaking rules.** As a DEO in Bihar shared:

> *"The rules are fixed, and we receive a notice if we break them from the district office. But sometimes, for the poorest, we make exceptions. After all, we are here to serve them"*
>
> (Interview #3, October 4th, 2022).

**Understanding DEOs as discretionary actors challenges the assumption that digitisation leads to procedural neutrality**. Instead, as we see in the case of DEOs, in the absence of role clarity, workload constraints, pressure from other authorities, necessitates improvisational skills and a moral justification of how these systems are bent. These attributes then become an important factor in how services are delivered and accountability is practiced which must be accounted for in policy design and implementation.

# Why This Matters: Propositions Going Forward

The story of the DEO cadre is not just a window into a changing bureaucracy but also one that gives a **window into the interaction between digital technologies and the welfare state.** These bureaucrats, skilled in using computers and MIS, are capable of managing large workloads with little to no training. Oftentimes the youngest in the office, they have emerged as a dependent pillar that most of the panchayat office turns to in order to complete their digitally enabled tasks.

At the DEO level **our research points to an urgent need for clearer articulation of competencies needed for the role.** These go beyond just data entry and include digital trouble shooting, time management, discretionary judgement, negotiation, and communication and even the delicate dynamics of engaging with citizens (Accountability Initiative, 2024). Building these competencies requires more than a one time session but calls for more sustained, tailored capacity building programmes. **Once identified, these competencies can be used to hire, train, and monitor DEOs with more precision than the current form where they are expected to find their own way within the jobs.**

At a professional level, at this stage, **DEOs are not recognised as a formal and permanent cadre (at least in the states where we conducted the study), and have little job security or scope for career advancement.** This can have implications on their motivation and accountability (Sharma, 2023). DEOs also currently lack professional support in their jobs at the panchayat and block levels. **Developing a structured pathway for DEOs - with defined service conditions, opportunities for growth and grievance redressal and maybe even additional financial incentives can improve not just individual outcomes but also institutional integrity (Bandiera, Khan, and Tobias, 2017).**

Lastly, at a system level, the relative invisibilisation of DEOs reveals a critical blind spot in digital policy frameworks. **Evaluations of welfare delivery often focus on outputs - number of citizens served, funds disbursed etc but rarely examine the human capacity or institutional arrangements needed.** Future studies on how DEOs contribute to the larger system of digital technologies for welfare governance at the frontline will enrich our understanding of how the state is experienced and enacted in everyday governance.

# Conclusion

In this paper we characterised and described an emerging and significant street level bureaucrat in digital governance - namely the DEO. Drawing on fieldwork in five states, we argued that DEOs are not merely data processors but central to the digital welfare state. They are responsible for managing complex digital systems, interacting with citizens and navigating overlapping administrative expectations - all the while lacking formal recognition and support.

Their role raises questions on the common understanding that digital technologies inherently reduce discretion and increase transparency and accountability. As we show, **technology has not removed the human element, but reshaped it. Discretion, negotiation and improvisation continue to define public service delivery, albeit in new forms**. As India's digital state continues to expand, the need to engage seriously with its human infrastructure becomes increasingly urgent. DEOs offer a compelling entry point into this conversation.

# References

Accountability Initiative (2024): "Strengthening Local Governance: A Study on Competencies of Grama Panchayat Functionaries in Karnataka", *Accountability Initiative*, New Delhi: Centre for Policy Research.

Alshallaqi, Mohammad (2022): "The complexities of digitization and street-level discretion: A socio-materiality perspective", *Public Management Review*, Vol 26, No 1, pp 25–47.

Bandiera, Oriana, Khan, Adnan. and Tobias, Julia (2017): "Rewarding bureaucrats: Can incentives improve public sector performance?", *IGC Growth Brief Series* 008. London: International Growth Centre.

Buffat, Aurélien (2013): "Street-Level Bureaucracy and E-Government", *Public Management Review*, Vol 17, No 1, pp 149–61.

Carswell, Grace, and Geert De Neve (2021): "Transparency, Exclusion and Mediation: How Digital and Biometric Technologies Are Transforming Social Protection in Tamil Nadu, India", *Oxford Development Studies*, Vol 50, No 2, pp: 126–41.

Digital India Programme (2025): Can be accessed online at: https://www.digitalindia.gov.in/

Lipsky, Michael (1980): *Street-Level Bureaucracy: Dilemmas of the Individual in Public Service*, New York: Russell Sage Foundation.

Masiero, Silvia (2016): "Digital Governance and the Reconstruction of the Indian Anti-Poverty System", *Oxford Development Studies,* Vol 45, No 4, pp: 393–408.

Mathur, Nayanika (2016): *Paper Tiger,* Cambridge: Cambridge University Press.

Pollitt, Christopher (2011): "Mainstreaming Technological Change in the Study of Public Management", *Public Policy and Administration*, Vol 26, No 4, pp 377–97.

Sharma, Rashmi (2023): "Frontline Functionaries In India: The Absent Policy", *State Capacity Initiative Working Paper No, 2023-8*, State Capacity Initiative, Centre for Policy Research.

Veeraraghavan, Rajesh (2015): "Open Governance and Surveillance: A Study of the National Rural Employment Guarantee Program in Andhra Pradesh, India", Dissertation submitted in *Information Management and Systems, Graduate Division,* Berkeley: UC Berkeley.

Zérah, Marie-Hélène (2020): "The Street-Level Bureaucracy at the Intersection of Formal and Informal Water Provision", *Oxford Research Encyclopedia of Environmental Science.*

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