

Closing the Last-Mile Digital Divide: Capability and Opportunity Barriers to Digital Government Access among India's Particularly Vulnerable Tribal Groups (PVTGs) and Pathways to Inclusion

Dr Yamuna Kilaru¹, Dr G.Steeven Raju²

¹Lecturer in Economics, ASD Government Degree College for Women(A), Kakinada

²Lecturer in Economics, Ideal College of Arts and Sciences (A), Kakinada

ABSTRACT

India's digital governance architecture anchored in Aadhaar, the India Stack, and over 596,000 Common Service Centres has been widely credited with extending public services to hundreds of millions of citizens. Yet this progress has largely bypassed the country's 75 Particularly Vulnerable Tribal Groups (PVTGs), an estimated 28–45 lakh (2.8–4.5 million) individuals characterised by geographical isolation, pre-agricultural livelihoods, and extremely low literacy. This paper applies the Capability-Opportunity-Motivation-Behaviour (COM-B) model and the “last-mile” framework articulated in the World Bank's 2026 report *The Behavioral Dividend* to examine why digital government services fail to reach and retain PVTG users even where infrastructure notionally exists. Restricting the analysis to Capability and Opportunity barriers, the paper identifies cognitive overload, oral-language and script exclusion, and low functional and digital literacy as capability-side constraints, and connectivity gaps, device unaffordability, documentation and Aadhaar-linkage failures, service fragmentation, weak support channels, and institutional distrust as opportunity-side constraints. Drawing on the behavioural toolkit of Behavioural User Journey Mapping and evidence from Indian programmes such as BharatNet, the Common Service Centre-Village Level Entrepreneur (CSC-VLE) network, the Aadhaar Enabled Payment System (AePS), and the Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN), the paper proposes capability-building and opportunity-enhancing solutions tailored to habitat-level PVTG realities, culminating in an integrated, PVTG-specific Behavioural User Journey Map and policy recommendations for converting India's digital dividend into a genuine behavioral dividend for its most marginalised citizens.

Keywords: last-mile digital divide; Particularly Vulnerable Tribal Groups; COM-B model; digital government; behavioural user journey mapping; India; digital inclusion

1. INTRODUCTION

Digital government has become the default delivery channel for welfare, identity, land, health, and financial services across India. Platforms such as Aadhaar, the Unified Payments Interface, DigiLocker,

and state e-governance portals are frequently presented as engines of an inclusive “digital dividend” the productivity and welfare gains that flow from digitising public administration (World Bank, 2016). Yet a growing body of evidence shows that infrastructure alone does not guarantee use. Even where connectivity, devices, and legal entitlements exist on paper, uptake among the most marginalised populations remains stubbornly low. This gap between the availability of a digital service and its actual, sustained use by the citizens who need it most has been termed the “last-mile problem” in digital government (Gill et al., 2026).

Nowhere is this last-mile problem more acute than among India's Particularly Vulnerable Tribal Groups (PVTGs) — 75 officially notified sub-groups of Scheduled Tribes, spread across 18 states and the Union Territory of Andaman and Nicobar Islands, identified by the Dhebar Commission (1960–61) on the basis of four criteria: pre-agricultural technology, stagnant or declining population, extremely low literacy, and subsistence-level economic backwardness (Ministry of Tribal Affairs, n.d.). Numbering an estimated 28–45 lakh persons depending on the counting methodology used, PVTGs are disproportionately concentrated in Odisha, Madhya Pradesh, Andhra Pradesh/Telangana, Chhattisgarh, and Jharkhand, and typically inhabit forested, hilly, or island “habitats” that are among the last to receive roads, electricity, mobile towers, and administrative outreach (Ministry of Tribal Affairs, n.d.; Press Information Bureau, 2023). The Government of India's flagship response — the Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN), launched in November 2023 with an outlay of approximately ₹24,104 crore — explicitly recognises that PVTG households “have remained unreached due to distance, lack of road and digital connectivity” (Ministry of Tribal Affairs, 2023), and identifies digital and documentation constraints absence of Aadhaar or bank accounts, low literacy, and poor network coverage as a central obstacle to delivering even physical entitlements such as housing and rations (IMPRI, 2025).

This paper argues that closing this gap requires more than physical infrastructure: it requires a behavioural diagnosis of why PVTG users disengage from digital services at each stage of the user journey from initial awareness through onboarding, transaction, and repeat use and a matching set of interventions designed around the real cognitive, linguistic, and environmental constraints these communities face. To structure this diagnosis, the paper draws on the Capability-Opportunity-Motivation-Behaviour (COM-B) model (Michie et al., 2011) as operationalised for digital government contexts in the World Bank's 2026 report *The Behavioral Dividend: Solving the ‘Last Mile’ Problem in Digital Government* (Gill et al., 2026). In line with the scope of this paper, the analysis is deliberately confined to the Capability and Opportunity components of COM-B the skills/knowledge and external/environmental conditions required for a behaviour to occur leaving Motivation (trust, habit, cost–benefit perception) as a related but separately treated dimension. The paper (i) maps PVTG-specific capability barriers, (ii) maps PVTG-specific opportunity barriers, and (iii) proposes a portfolio of solutions grounded in Indian and comparative practice, culminating in a proposed Behavioural User Journey Map for PVTG digital service delivery.

2. CONCEPTUAL FRAMEWORK: THE LAST-MILE PROBLEM AND THE COM-B MODEL

2.1 The Last-Mile Problem in Digital Government

The “last mile” in digital government describes the final, human-facing gap between a technically functional service and its actual adoption by an intended user (Gill et al., 2026). Cross-country evidence cited in the World Bank's analysis shows that only around a quarter of citizens surveyed across thirteen countries regularly use government digital channels, with poor user experience not lack of access alone the most commonly cited barrier (Gill et al., 2026, citing Deloitte Insights, 2023). The report characterises

this as a “lost path”: users who are initially attracted to a service drop out at successive stages awareness, consideration, onboarding, navigation, payment, confirmation, and reuse such that only a small fraction complete a transaction and return. Each stage has a characteristic failure mode: the “Empty Store” (services nobody knows exist), the “Crossroads with No Signs” (unclear value or complexity that stalls uptake), the “Closed Gate” (onboarding friction), the “Lost Path” (navigation breakdown mid-transaction), the “Last-Minute Wobble” (trust collapse at commitment), the “Panic Loop” (post-submission anxiety), and the “One-Time Wonder” (failure to generate repeat use) (Gill et al., 2026). For PVTG communities, each of these failure points is amplified by structural remoteness and historical exclusion, making the last-mile problem not an edge case but the dominant condition of service delivery.

2.2 The COM-B Model

The COM-B model, developed by Michie, van Stralen, and West (2011) and adapted by Gill et al. (2026) for digital-government diagnosis, holds that for any behaviour (B) such as completing an online welfare application to occur, a person requires Capability, Opportunity, and Motivation.

Capability refers to an individual's physical and psychological capacity to perform the behaviour: the digital skills, language comprehension, and cognitive bandwidth needed to interact with a service (Gill et al., 2026). Opportunity refers to the external, environmental conditions that make the behaviour possible: connectivity, devices, integrated services, and support channels (Gill et al., 2026). Motivation refers to the internal drivers beliefs, habits, trust, and cost–benefit perceptions that sustain the behaviour once capability and opportunity are present (Gill et al., 2026). Because a service can fail if any single one of these three components is absent, the model allows a precise diagnosis of where not just whether a service is failing a given population, and directs design interventions accordingly: simplifying processes builds capability, improving access points creates opportunity, and incentives or trust-building strengthen motivation (Gill et al., 2026).

This paper restricts its empirical and policy focus to Capability and Opportunity because these two dimensions correspond most directly to the structural preconditions of digital access for PVTGs literacy, language, connectivity, devices, and documentation which must be addressed before motivational interventions (trust-building, nudges, incentive design) can gain any traction. A community that cannot physically access a network, or cannot read the language a form is written in, cannot be “motivated” into using a service it structurally cannot reach.

2.3 Behavioural User Journey Mapping

Complementing COM-B, Behavioural User Journey Mapping (BUJM) traces a user's experience of a service step-by-step awareness, consideration, access, navigation, payment, confirmation, and follow-up to locate precisely where drop-off occurs and why (Gill et al., 2026). Applied to PVTG contexts, BUJM is particularly valuable because it disaggregates a single, generic label “digital exclusion” into a sequence of discrete, addressable failure points, several of which (e.g., awareness of a scheme's existence, versus inability to complete an onboarding form) require entirely different interventions even though both present externally as “non-usage.”

3. PVTGs IN INDIA: PROFILE AND THE STRUCTURAL DIGITAL DIVIDE

India recognises 75 PVTGs across 18 states and the Union Territory of Andaman and Nicobar Islands, renamed from “Primitive Tribal Groups” in 2006 (Ministry of Tribal Affairs, n.d.). Population estimates vary by source and counting year the 2011 Census recorded roughly 28 lakh individuals under the earlier PTG classification, while more recent habitat-level and ministry estimates place the figure closer to 40–

48 lakh (Ministry of Tribal Affairs, n.d.; Vajiram & Ravi, 2025) but all sources agree that PVTGs remain the most demographically fragile and geographically dispersed segment of India's roughly 10.45 crore Scheduled Tribe population. Odisha hosts the largest number of recognised PVTG communities (13) and the largest single population (the Saura, at approximately 5.35 lakh), followed by Madhya Pradesh and Andhra Pradesh/Telangana (StudyIQ, 2026). At the extreme end, groups such as the Shompen of Great Nicobar number only in the low hundreds (Lukmaan IAS, 2026).

Three structural features of PVTG life directly shape their relationship to digital government and map onto the Capability–Opportunity distinction used in this paper:

- Habitat isolation. PVTGs typically live in forested, hilly, or island habitats that are the last to receive roads, electricity, and telecommunications infrastructure a pattern PM-JANMAN explicitly targets through mobile-tower installation under the Universal Service Obligation Fund (Bharat Rural Livelihoods Foundation, n.d.).
- Extremely low formal literacy. Literacy among PVTGs is frequently below 10–20 percent, compared with the national average, constraining the ability to read forms, understand eligibility criteria, or navigate menu-driven interfaces even where these are technically accessible (Lukmaan IAS, 2026).
- Documentation deficits. Many PVTG individuals lack the foundational identity documents (Aadhaar, bank accounts) on which nearly all digital government services are built, meaning the last-mile problem for PVTGs often begins even before a “digital” interaction is attempted (IMPRI, 2025).

These three features mean that, for PVTGs, capability and opportunity barriers are not marginal frictions layered on top of an otherwise functioning system they are close to the entire explanation for non-engagement. This justifies treating them as the primary analytical lens for this paper.

4. METHOD

This paper adopts a conceptual, framework-driven methodology rather than primary fieldwork. It synthesises (i) the COM-B-based diagnostic and solutions taxonomy set out in Gill et al. (2026), a World Bank report drawing on evidence from over a dozen countries' digital government programmes, and (ii) India-specific secondary evidence on PVTG demography, infrastructure, and digital-inclusion programming drawn from Government of India sources (Ministry of Tribal Affairs, Press Information Bureau, Department of Telecommunications) and peer-reviewed literature on e-government adoption in India and comparable developing-country contexts. The barriers identified in the World Bank framework's cross-cutting “Ideas Bank” are mapped onto documented PVTG conditions to test their applicability, and the framework's corresponding solutions bank is filtered and adapted for habitat-level, low-literacy, oral-language contexts. This approach is appropriate for an early-stage, policy-oriented contribution whose purpose is to structure a diagnostic and solution agenda for future empirical and pilot-based research, rather than to test a causal hypothesis.

5. CAPABILITY BARRIERS TO DIGITAL GOVERNMENT ACCESS AMONG PVTGs

5.1 Cognitive Overload

Digital government interfaces routinely require users to process dense textual instructions, multiple form fields, and sequential decision points within a single session (Gill et al., 2026, drawing on Sweller & Chandler, 1991). For PVTG users encountering a government portal, application, or biometric kiosk for the first time often without any prior exposure to comparable bureaucratic interfaces the volume of unfamiliar information (eligibility criteria, document checklists, form terminology) can overwhelm

working memory and produce abandonment rather than error. This is compounded where enrolment for entitlements bundled into PM-JANMAN (housing, water, health, skilling) requires navigating several distinct application processes rather than a single integrated one.

5.2 Low Digital and Functional Literacy

Digital literacy the skills needed to operate a smartphone, navigate menus, and complete online transactions cannot be assumed where general literacy itself is below 10–20 percent (Lukmaan IAS, 2026). The UN's 2024 E-Government Survey formally added “e-government literacy” as an evaluation metric precisely because literacy, not merely access, determines whether vulnerable groups can use digital services once connected (Gill et al., 2026, citing UN DESA, 2024). Without structured, in-person training and repeated practice, PVTG users particularly older adults with no prior schooling are likely to default to whatever in-person or intermediary channel remains available, regardless of its cost or inconvenience.

5.3 Language and Script Exclusion

Most Indian e-governance platforms operate in Hindi, English, or a state's dominant regional language, rendered in a standard script. PVTG communities frequently speak distinct tribal languages or dialects many primarily oral, without a standardised written script that do not correspond to the language options offered by digital interfaces. This extends the general finding that non-proficiency in a platform's official language excludes users (Gill et al., 2026) to a uniquely acute Indian case: languages with no textual form at all cannot be served by translated text options and instead require voice- or symbol-based interfaces.

5.4 Choice and Procedural Overload

Where PVTG households do reach a digital or intermediated touchpoint such as a Common Service Centre they are frequently confronted with a proliferation of scheme options (housing, health, education, land, skilling, financial inclusion) without a clear, prioritised pathway matched to their situation. Choice overload of this kind, well documented in the general e-government literature (Gill et al., 2026, citing Chernev et al., 2015), is particularly disabling for first-time, low-literacy users who lack the evaluative capability to judge which of several similarly worded schemes applies to their household.

6. OPPORTUNITY BARRIERS TO DIGITAL GOVERNMENT ACCESS AMONG PVTGs

6.1 Connectivity Gaps

The UN E-Government Survey 2024 records that 81 percent of urban Indians used the internet in 2023, against just 50 percent of rural residents (Gill et al., 2026, citing UN DESA, 2024) and PVTG habitats sit at the far end of even this rural distribution, frequently beyond any mobile network footprint at all. PM-JANMAN's Department of Telecommunications component explicitly commits to installing mobile towers in “uncovered villages and habitations” under the Universal Service Obligation Fund (Bharat Rural Livelihoods Foundation, n.d.), while the pre-existing BharatNet programme has extended subsidised rural broadband at roughly a 76 percent discount on bulk bandwidth across some 250,000 local bodies at a cumulative cost of approximately ₹1.8 lakh crore (Gill et al., 2026, citing Press Information Bureau, 2025; Universal Service Obligation Fund, n.d.). Even so, physical PVTG habitats as opposed to administrative block or panchayat headquarters often remain the final, un-serviced segment of this rollout.

6.2 Device Availability and Affordability

Smartphone or computer ownership cannot be assumed in subsistence-economy PVTG households. Where devices exist, they are frequently shared within a family or community rather than individually owned, and data costs even where subsidised represent a meaningful share of household income (Gill et al., 2026). This mirrors the pattern observed in Mongolia, where the government built its entire e-Mongolia

platform around mobile-first design after recognising that 92 percent of citizens owned a phone against just 35 percent owning a computer (Gill et al., 2026, citing Deloitte Center for Government Insights, 2024).

6.3 Documentation and Digital Identity Barriers

Because Aadhaar underpins most Indian digital government transactions, the absence of Aadhaar enrolment or a linked bank account common among PVTG households owing to remoteness, seasonal or semi-nomadic mobility, and past exclusion from enumeration exercises constitutes an opportunity barrier that precedes any interface-level friction (IMPRI, 2025). PM-JANMAN's own implementation documentation identifies this explicitly, noting that low literacy and poor network coverage compound difficulties in completing documentation-dependent digital processes such as the Awaas+ housing-registration application, and that erroneous deletion of job-card records under related schemes further disrupts eligibility (IMPRI, 2025).

6.4 Service Fragmentation

PVTG entitlements are distributed across at least nine central ministries under PM-JANMAN alone — tribal affairs, power, telecommunications, education, health, rural development, and others (Bharat Rural Livelihoods Foundation, n.d.) each frequently operating a separate digital or semi-digital touchpoint. This mirrors the general finding that non-integrated services drive users back toward in-person channels perceived as more reliable (Gill et al., 2026, citing UN DESA, 2024), a dynamic likely to be more pronounced for PVTG households navigating multiple disconnected systems with minimal literacy support.

6.5 Weak Support Channels

Only a minority of city e-government portals globally offer live chat support (23 percent) or user guidance/tutorials (45 percent) (Gill et al., 2026, citing UN DESA, 2024); PVTG habitats, being both rural and remote even by Indian standards, are structurally the least likely locations to have access to any of the above, or to a physical help desk, leaving households dependent on the availability and competence of a single local intermediary typically a Common Service Centre Village-Level Entrepreneur (VLE) or an Anganwadi/frontline worker for every stage of a digital transaction.

6.6 Sludge and Administrative Burden

“Sludge” unnecessary procedural friction such as unclear eligibility rules or unexplained delays erodes trust and drives drop-out even where it does not formally block access (Gill et al., 2026, citing Varazzani et al., 2024). For PVTG applicants already facing steep capability barriers, ambiguous eligibility language or an unexplained processing delay is far more likely to be interpreted as final rejection than as a resolvable, temporary state, particularly where no support channel exists to clarify it.

6.7 Weak Social-Trust Infrastructure

Opportunity, in the COM-B sense, also includes the presence of a supportive social network that can model and reinforce a new behaviour (Gill et al., 2026). Where no one in a PVTG community has previously and visibly completed a given digital transaction, there is no local proof of concept to reduce perceived risk for the next household an opportunity gap that is distinct from, but reinforces, the individual motivational trust barriers documented elsewhere in the literature on Indian e-government adoption (Samuel et al., 2020).

7. TOWARDS A BEHAVIORAL DIVIDEND: SOLUTIONS FOR PVTG DIGITAL INCLUSION

Consistent with the COM-B logic that interventions should be matched to the specific barrier component they address (Gill et al., 2026), the following solutions are organised into capability-building and

opportunity-enhancing measures, drawing on Indian programmes already operating at scale and on comparative practice documented in the World Bank framework.

7.1 Capability-Building Solutions

Village-Level Digital Champions. India's existing network of over 596,000 Common Service Centres, staffed by locally recruited Village-Level Entrepreneurs (VLEs) who guide users through online services and build local trust in digital tools, already provides an intermediated-access model at low per-centre cost (roughly ₹50,000–1,00,000, with an estimated annual return of 20–40 percent) (Gill et al., 2026). Extending this model with PVTG-specific “digital champions” community members trained not only in device operation but in the specific schemes bundled under PM-JANMAN would embed capability-building within, rather than external to, the community.

Oral and Visual, Rather Than Text-First, Interfaces. Given the prevalence of unscripted tribal languages, capability solutions should prioritise voice-based interaction (interactive voice response, voice assistants in major tribal languages), pictographic instructions, and video-based tutorials over text-heavy interfaces extending the logic of gamified microtutorials shown elsewhere to rapidly build digital confidence (Gill et al., 2026, citing the GSMA Mobile Internet Skills Training Toolkit's 228 percent increase in mobile internet usage in Bangladesh).

Real-Time, Plain-Language Feedback. Interfaces and intermediaries alike should provide immediate, comprehensible confirmation at each step (e.g., simple progress indicators, clear error explanations) rather than generic system messages, mirroring the approach of South Africa's SARS eFiling platform, which paired real-time input warnings with a progress tracker to help drive 77.2 percent of taxpayer payment value online (Gill et al., 2026).

Single, Prioritised Pathways. To counter choice overload, PVTG-facing touchpoints should present one clear, sequenced pathway matched to household circumstances (e.g., “first Aadhaar, then bank account, then scheme enrolment”) rather than a menu of parallel scheme options, reducing the evaluative burden on first-time, low-literacy users.

7.2 Opportunity-Enhancing Solutions

Completing Last-Mile Connectivity. PM-JANMAN's commitment to mobile-tower installation in uncovered PVTG habitats under the Universal Service Obligation Fund should be sequenced and tracked at the habitat, not district, level, and should be explicitly linked to BharatNet's subsidised broadband backbone so that the final, most remote segment of the network rather than only administrative headquarters is prioritised (Bharat Rural Livelihoods Foundation, n.d.; Gill et al., 2026).

Device-Sharing and Biometric Micro-Access Points. The Aadhaar Enabled Payment System (AePS), which already provides banking access to individuals without personal devices in remote areas through micro-ATMs using biometric authentication (having processed over 17.52 billion transactions by mid-2023), offers a proven, low-literacy-compatible model that could be extended to broader service categories beyond payments for PVTG habitats without individual device ownership (Gill et al., 2026).

Mobile-First, Lightweight Platform Design. Given that phone ownership will outpace computer ownership in PVTG households for the foreseeable future, PVTG-facing services (Awaas+, scheme-enrolment portals) should be designed and tested primarily for low-end smartphones and low-bandwidth conditions, following the mobile-first redesign that allowed Mongolia's e-Mongolia platform to scale from 181 to over 1,263 services and reach 1.9 million users (Gill et al., 2026).

One-Time, Integrated Enumeration and Documentation Drives. Because documentation gaps precede almost all subsequent digital friction, dedicated Aadhaar-and-bank-account enrolment camps should be

conducted at the habitat level as a distinct, prioritised first step within PM-JANMAN's rollout, rather than assumed as a precondition already met directly addressing the “digital and documentation constraints” PM-JANMAN's own implementation reviews have identified (IMPRI, 2025).

Consolidated, Multipurpose Physical-Digital Touchpoints. PM-JANMAN's planned construction of 1,000 multipurpose centres (MPCs) under the Van Dhan Vikas Kendra initiative (Bharat Rural Livelihoods Foundation, n.d.) should function as single-window points combining connectivity, a trained intermediary, and access to the full range of schemes across the nine implementing ministries directly addressing service fragmentation by co-locating what is currently dispersed across separate departmental systems.

Locally Visible Support Channels. Given the near-total absence of live chat or online tutorials reaching PVTG habitats, support should be delivered through the same trusted, in-person channel used for capability-building (VLEs, frontline health/anganwadi workers), supplemented by simple toll-free voice helplines in major tribal languages, rather than through web-based support infrastructure alone.

Community Proof-of-Concept and Peer Demonstration. Because opportunity includes the presence of a supportive social network, structured peer-demonstration events in which an early PVTG adopter of a scheme publicly and successfully completes a transaction with community members present can substitute for the “social norms” opportunity that is otherwise absent in communities with no prior digital transaction history (Gill et al., 2026).

7.3 A Proposed PVTG Behavioural User Journey Map

Applying BUJM to the PVTG context (Gill et al., 2026) suggests a sequenced intervention logic: (1) Awareness IEC campaigns of the kind already initiated under PM-JANMAN, delivered orally and through trusted intermediaries rather than print or digital media; (2) Documentation habitat-level Aadhaar and bank-account enrolment preceding any scheme-specific onboarding; (3) Access a single multipurpose centre per habitat cluster, connected via BharatNet/USOF infrastructure; (4) Navigation VLE- or digital-champion-assisted, voice/visual-first form completion with a single prioritised pathway; (5) Confirmation plain-language, orally delivered confirmation rather than a text-only receipt or SMS; and (6) Reuse periodic, community-based refresher sessions timed to scheme renewal cycles, reinforced by visible peer success stories. This sequencing converts the seven generic “lost path” failure points identified by Gill et al. (2026) into a “guided trail” specific to PVTG habitat conditions.

8. DISCUSSION

The evidence assembled here suggests that, for PVTGs, the last-mile problem in digital government is less a matter of interface design in the conventional sense and more a matter of structural capability and opportunity deficits that precede any interface at all. This has two implications for policy. First, digital-inclusion investment sequencing matters: connectivity and documentation drives (opportunity) must precede literacy and interface training (capability) at the habitat level, since neither is individually sufficient a fully trained user with no network access, or a fully connected habitat with no locally trusted intermediary, will each independently fail to convert into sustained use. Second, because PVTGs are demographically small, dispersed, and heterogeneous (75 distinct groups with distinct languages and livelihood patterns), a single national interface redesign cannot substitute for habitat-level, intermediary-based delivery; the Common Service Centre-VLE model, extended and adapted, is likely to remain the primary vehicle for capability- and opportunity-bridging for the foreseeable future, even as connectivity infrastructure under BharatNet and PM-JANMAN expands.

This paper's scope has limitations. By design, it excludes Motivational barriers trust, present bias, status-quo preference, and social-norm effects which the underlying COM-B framework and existing Indian e-government literature (e.g., Samuel et al., 2020, on ambiguity aversion in Indian municipal digital services) suggest are also material, and which merit dedicated treatment given the historically fraught relationship between PVTG communities and state institutions. The analysis is also conceptual and secondary-source-based rather than field-validated; the specific solutions proposed in Section 7 should be piloted and evaluated at habitat level for example through phased rollout across a small number of PVTG habitats with before/after tracking of the BUJM stages set out in Section 7.3 before being generalised across all 75 PVTG communities, whose linguistic, livelihood, and geographic diversity means no single intervention package is likely to transfer uniformly.

9. CONCLUSION

India's digital government infrastructure has advanced rapidly, but infrastructure alone does not close the last-mile gap for its Particularly Vulnerable Tribal Groups. Applying the COM-B model's Capability and Opportunity dimensions to PVTG contexts shows that cognitive overload, low digital and functional literacy, language and script exclusion, and choice overload on the capability side, combined with connectivity gaps, device unaffordability, documentation deficits, service fragmentation, weak support channels, procedural sludge, and thin social-trust infrastructure on the opportunity side, jointly explain why PVTG engagement with digital services remains low even as national platforms scale. Programmes already underway BharatNet, the CSC-VLE network, AePS, and PM-JANMAN provide a foundation on which PVTG-specific, habitat-level, intermediary-based, and largely oral/visual interventions can be built. Converting India's digital dividend into a genuine behavioral dividend for its most vulnerable citizens will require treating capability- and opportunity-building not as downstream implementation detail, but as the primary design objective of digital government for PVTG communities.

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