Platform Futures Framework

A Methodological Framework to Assess Digital Platform Viability and Sustainability for Marginalized Users in the Global South

Aditi Bhatia-Kalluri

Abstract

This article proposes a methodological framework – the Platform Futures Framework – with the purpose of revealing and analyzing the plural techno-futures embedded in digital platform adoption by marginalized users in the Global South. Dominant platform theories, largely developed in the Global North, often overlook the socio-economic, infrastructural, and cultural specificities of Southern contexts, as well as the competing futures imagined by state actors, corporate stakeholders, and local communities. This framework addresses these gaps through a localized, multisided analysis that evaluates platforms as both technical infrastructures and sites of future-making. Drawing on qualitative research with India's Unified Payments Interface (UPI), it builds on and extends approaches such as Duncombe's livelihood framework by integrating a critical assessment of mediation, infrastructural dependencies, and governance practices. Organized around four analytical pillars – Vision (identifying whose futures are imagined and institutionalized), Circumstantial Assessment (mapping contextual factors, user vulnerabilities, and infrastructures that shape future trajectories), Synthesis (tracing where hegemonic and grassroots futures intersect or diverge), and Actions (formulating strategies for more inclusive, multi-futural platform governance) – the framework situates platform evaluation within broader cultural and political economies of technology. By integrating insights from political economy, platform studies, and development research, it provides policymakers, researchers, and platform designers with a futures-oriented toolkit for understanding and engaging with the diverse, often contested techno-futures of the Global South.

Keywords

digital platforms, marginalized users, platform sustainability, techno-futures, global south

DOI 10.14361/dcs-2025-0205

Introduction

Unified Payments Interface and the Digital Turn: Vision and Realities

The interest in the conceptual impetus of a Platform Futures Framework emerged during my fieldwork on marginalized users' experiences with India's Unified Payments Interface (UPI), which exposed tensions between its intended design and on-the-ground adoption. UPI – developed by the National Payments Corporation of India under the Reserve Bank's oversight – sits at the heart of the government's "Digital India" and cashless economy agenda. UPI accounts for 84% of India's digital retail payments (Economic Times 2024). UPI's growth accelerated after the 2016 demonetization, which abruptly withdrew 86% of cash in circulation. Nearly a decade later, UPI has become the backbone of India's digital retail payments infrastructure – an interoperable, bank-to-bank system enabling instant person-to-person and person-to-merchant transfers via mobile apps – processing more than 20 billion transactions in a single month (August 2025) and accounting for roughly 84% of digital retail payment volumes. Yet scale and policy celebration do not translate into evenly distributed inclusion: Despite rapid national-level uptake, which is often cited as evidence of success, UPI adoption remains uneven across regions, genders, and occupational groups, with marginalized micro-entrepreneurs disproportionately affected by infrastructural instability, limited digital literacy, and constrained access to devices and connectivity (Goswami 2016). Ten years after its introduction, UPI exemplifies how dominant techno-futures of efficiency and scale can advance rapidly at the national level while remaining only partially realized – or actively contested – in the everyday financial practices of marginalized communities.

For artisan micro-entrepreneurs, UPI brought both gains and barriers. QR-code payments enabled remote sales, reduced cash-handling risks, and streamlined benefit transfers, yet low literacy, limited digital skills, and poor infrastructure hindered uptake. Qualitative fieldwork shows that many used UPI only to receive payments before cashing out, or avoided it entirely due to distrust or technical issues. Such patterns reflect not just a digital divide but competing visions of financial futures embedded within platform adoption, where formal inclusion coexists with partial, mediated, or strategic use.

UPI thus becomes a meeting point for state-led techno-futurist narratives and everyday negotiations of inclusion and exclusion, revealing the gap between imagined modernization and lived marginalization. This gap points to a broader methodological problem. Platform governance and digital inclusion frameworks typically evaluate success through adoption, performance, or scale-based metrics. In marginalized contexts, however, adoption is often intermittent, mediated through social relations, shaped by infrastructural breakdowns, or accelerated through policy shocks rather than voluntary uptake.

This article makes a methodological intervention in platform governance and digital inclusion research by shifting evaluation away from adoption-centric metrics toward an analysis of digital platforms as inclusive future-making infrastructures. Rather than presenting an evaluative toolkit ex ante, the Platform Futures Framework is inductively derived through an iterative analytical process from qualitative fieldwork on India's Unified Payments Interface and conceptually refined through sustained engagement with platform studies, political economy, and development literature. Empirical tensions observed during fieldwork – between policy-imagined futures and everyday platform practices – served as the primary analytic entry point for abstraction, informing the identification and articulation of the framework's core pillars.

Organized around four analytical pillars – Vision (identifying whose futures are imagined and institutionalized), Circumstantial Assessment (mapping contextual factors, user vulnerabilities, and infrastructures that shape future trajectories), Synthesis (tracing where hegemonic and grassroots futures intersect or diverge), and Actions (formulating strategies for more inclusive, multi-futural platform governance) – the framework situates platform evaluation within broader cultural and political economies of technology.

The framework thus emerges from a grounded analysis of how state-led digital futures are negotiated, mediated, and reworked in everyday platform use among marginalized micro-entrepreneurs, foregrounding the tensions between projected visions of inclusion and their situated enactment under conditions of infrastructural precarity. While developed as an analytic tool for researchers studying digital platforms, the Platform Futures Framework is also intended for policymakers and institutional actors involved in digital infrastructure design, regulation, and implementation. By foregrounding future-making, sustainability, and uneven adoption, the framework supports reflective policy evaluation beyond uptake-centric success metrics.

To guide the reader through the framework and its application, I outline the paper's structure and the sequence of analytic steps below. The article proceeds as follows. The next section reviews platform governance, digital inclusion, and techno-futures scholarship to clarify why adoption- and scale-led evaluation remains insufficient for assessing platform sustainability among marginalized users. The methodology section then outlines the qualitative fieldwork and iterative analytic process through which the Platform Futures Framework is derived. The subsequent section introduces the framework's four pillars – Vision, Circumstantial Assessment, Synthesis, and Action – followed by an application toolkit that operationalizes these pillars through indicators, guiding questions, and scoring criteria. The framework is then illustrated through a demonstration of UPI to show how the pillars can be applied using qualitative and documentary evidence. The article closes by outlining limitations and summarizing the framework's methodological contribution to futures-oriented platform evaluation.

Literature Review

This literature review proceeds in four moves: it (1) identifies the limits of adoption- and performance-led sustainability assessment, (2) situates platform inclusion debates in Global South political economies, (3) introduces techno-futures and infrastructural imaginaries as an evaluative lens, and (4) positions Duncombe's livelihood framework as a methodological pivot toward the Platform Futures Framework.

Platform Governance and the Limits of Sustainability Assessment

Digital platform scholarship has emerged across the fields of economics, communication studies, and political economy to theorize platforms as organizational and infrastructural systems mediating interactions between multiple user groups. Foundational work conceptualizes platforms as data-driven intermediaries that extract and coordinate value at scale (Srnicek 2017), while others emphasize their hybrid role in market organization and coordination (Coyle 2018). Institutional definitions similarly frame platforms as intermediaries facilitating interactions between interdependent groups (OECD 2019). More recent scholarship extends these views by situating platforms as socio-technical infrastructures that shape markets, governance arrangements, and social norms (Plantin et al. 2018; Van Dijck/Poel/De Waal 2018).

In this article, sustainability refers to the enduring and continued use of a digital platform over time – particularly its ability to remain viable, trusted, and usable for marginalized users beyond moments of initial adoption or policy-driven rollout – rather than to environmental sustainability. Within platform governance and policy-oriented scholarship, however, sustainability is rarely examined explicitly in these terms. Dominant platform governance and sustainability assessments tend to operationalize success through uptake, scale, efficiency, market stability, and regulatory compliance, treating sustained growth or infrastructural durability as proxies for long-term viability (Gorwa 2019; Helberger/Pierson/Poell 2018; Van Dijck/Poell/De Waal 2018). Policy and benchmarking frameworks similarly prioritize measurable performance indicators – such as transaction volumes, interoperability, or institutional robustness—over the conditions required for continued, meaningful use among marginalized populations (OECD 2019; World Benchmarking Alliance 2020).

As a result, these assessments often implicitly assume stable infrastructure, autonomous users, and relatively frictionless participation, leaving under-theorized how platforms function under conditions of infrastructural unreliability, mediated access, and social heterogeneity. This evaluative orientation becomes particularly limiting in contexts where platform participation is shaped not by seamless adoption but by intermittent use, social mediation, and adaptation to breakdowns. As platforms increasingly function as infrastructures of governance

and service delivery (Plantin et al. 2018; Larkin 2013), these limitations raise a methodological question: how can platforms be evaluated in ways that capture not only performance, but the uneven socio-technical conditions under which they are made workable?

Platform Capitalism, Digital Inclusion, and the Global South

Scholarship on platform capitalism and digital development has demonstrated that assumptions of frictionless use and autonomous agency rarely hold in the Global South (Toyama 2015). Studies of digital inclusion emphasize that access is mediated by literacy, trust, infrastructural reliability, and social relations, rather than determined solely by connectivity or device ownership (Srinivasan 2020). In India, platform expansion has unfolded alongside state-led digital modernization agendas that align public policy with corporate growth, producing what Athique and Parthasarathi (2020) describe as platform capitalism embedded within nationalist development narratives (see also Sen 2016 on the making of India's 'information nation' through digital policy imaginaries). Platforms localize operations to comply with regulatory regimes while simultaneously advancing logics of formalization, massification, and mediatization (Bouquillion 2023; Parthasarathi/Agarwal 2023).

Importantly, universalist narratives of digital inclusion are not exclusive to the Global North; they circulate globally and are reproduced through nationalist policy imaginaries in India and elsewhere. The issue, therefore, is not geography per se, but the global diffusion of measurement logics that treat adoption as a proxy for empowerment while bracketing mediation, infrastructural fragility, and unequal capacities. While two-sided and multi-sided market theories explain platform growth and network effects (Rochet/Tirole 2003; Evans/Schmalensee 2016), critical political economy research cautions that platformization – particularly in fintech – can consolidate markets and deepen inequality (Langley/Leyshon 2021).

Techno-Futures, Infrastructural Imaginaries, and Platform Evaluation

Recent work in science and technology studies and cultural studies has emphasized that technologies do not merely respond to social needs but actively project and stabilize particular visions of the future. Concepts such as sociotechnical imaginaries and infrastructural power foreground how technologies materialize normative assumptions about progress, efficiency, and participation (Plantin et al. 2018; Van Dijck/Poell/De Waal 2018). From this perspective, platforms function not only as transactional systems but as future-making infrastructures, embedding assumptions about how economies, publics, and forms of inclusion ought to operate (cf. Mukherjee 2019 on infrastructural imaginaries shaping development futures in the Global South).

In marginalized contexts, these projected futures often encounter frictions that give rise to alternative or counter-futures, enacted through informal practices, social mediation, and selective use. Bottom-up adaptations – such as reliance on intermediaries or parallel informal platforms – do not simply signal failure but reflect culturally embedded negotiations of trust, authority, and value (see Bhatia 2023 on bottom-up digital imaginaries emerging through mediated and informal platform use).

This gap underscores the need for methodological approaches that treat platforms simultaneously as infrastructures, governance systems, and sites of contested techno-futures. Such an approach must be capable of tracing how platform visions are translated, resisted, or reworked across users, institutions, and infrastructural conditions.

Duncombe's Livelihood Framework as a Methodological Pivot

Within the literature on internet and communication technologies (ICTs) and development, Duncombe's (2006) livelihood framework – adapted from the sustainable livelihoods approach – offers one of the most robust starting points for evaluating technology use in marginalized economic contexts. Duncombe's framework examines livelihoods through four interconnected dimensions: (1) vulnerability contexts, referring to external shocks and pressures shaping people's options; (2) assets or "capitals," including human, social, financial, physical, and natural resources; (3) structures and processes, encompassing institutions, policies, and cultural norms; and (4) livelihood strategies and outcomes, such as income generation, reduced vulnerability, or improved well-being. By situating ICT use within these dimensions, the framework enables analysis of how technology interacts with both everyday practices and broader structural conditions. In this article, I take Duncombe's framework as my methodological starting point, while extending it to address the infrastructural, governance, mediation, and techno-futures dynamics specific to digital platforms in the Global South.

Duncombe's framework is particularly valuable for foregrounding end users' perspectives and everyday practices while maintaining attention to institutional and structural factors. However, it was not designed to analyse digital platforms as multi-sided, governance-intensive infrastructures. Three limitations are especially salient for platform contexts.

First, while the framework refers to structures and processes, it does not encourage analysis from the platform operator's or governance perspective, limiting its capacity to account for multi-sided marketplaces and platform design decisions. Second, although mediated access could be interpreted as a form of social or human capital within Duncombe's asset categories, the framework does not treat mediation as a central analytic category. In platform contexts, mediation is not merely a resource users draw upon, but a structural condition shaped by platform design, governance arrangements, and infrastructural constraints.

Reliance on family members, intermediaries, or informal networks often determines whether and how platforms can be used at all, while simultaneously introducing dependencies, redistributing control, and constraining user agency. Third, the framework remains oriented toward outcomes rather than interrogating the ideological and cultural narratives through which platforms frame their goals, such as assumptions of frictionless transactions or universal digital literacy.

These limitations become particularly consequential when platforms function as instruments of state policy and economic formalization, projecting specific visions of digital futures that may conflict with lived realities.

Toward a Platform Futures Framework

Building on – but moving beyond – Duncombe's livelihood framework, this article proposes the Platform Futures Framework as a methodological intervention that integrates insights from political economy, platform studies, and development studies. Rather than focusing solely on how individuals strategize to sustain livelihoods, the framework introduces a multi-sided analysis that accounts for platform governance, infrastructural dependencies, mediation practices, and techno-futures imaginaries.

The framework is designed to identify gaps that shape platform sustainability at early and ongoing stages of deployment, enabling evaluators to examine not only whether platforms are adopted, but *how* they are made workable under uneven conditions. Critically, it allows platforms to be read not just as service infrastructures, but as sites where socio-technical futures are contested – between top-down visions of efficiency and inclusion, and bottom-up improvizations that reflect alternative aspirations, constraints, and values.

Methodology

The Platform Futures Framework is derived primarily from user-side qualitative fieldwork, with institutional analysis serving a contextual and illustrative role. Accordingly, the framework is positioned as a methodologically grounded lens that can be operationalized through deeper institutional, design, or policy analysis in future research. This framework is scoped to fintech and digital payment platforms, including state-led, hybrid, and for-profit payment systems. While such platforms may operate as utilities, governance infrastructures, or commercial services, platform type is treated here as a contextual classification rather than an analytic indicator within the framework.

The section first describes the field site and participants, then details data collection and analysis, and finally explains how findings were organized across the framework's analytic domains.

Research Design and Analytical Orientation

This study adopts a qualitative case-study design oriented toward methodological framework construction rather than hypothesis testing or policy evaluation. The empirical case of India's Unified Payments Interface is used as a generative site through which the Platform Futures Framework is inductively derived.

Methodologically, the framework is produced through an iterative analytical process. First, qualitative fieldwork with marginalized micro-entrepreneurs was used to surface recurring patterns of mediation, infrastructural breakdown, trust, adaptation, and agency. Second, these empirical patterns were abstracted into higher-level analytical constructs through sustained engagement with platform governance, political economy, and development literatures. Third, the constructs were refined and stabilized into four interrelated pillars – Vision, Circumstantial Assessment, Synthesis, and Action, that together operationalize platforms as future-making infrastructures.

Site and Context

Fieldwork was conducted at Shilparamam, from December 2021 to June 2022, approximately five years after demonetization, at a government-operated handicrafts marketplace in Hyderabad, India. The site functions as a periodic commercial hub bringing together marginalized handicraft micro-entrepreneurs from across the country. It is analytically significant because it concentrates on heterogeneous users, uneven digital capacities, and infrastructural fragilities within a shared transactional environment: The marketplace operates under conditions of infrastructural precarity, including intermittent internet connectivity, inconsistent electricity supply, shared or low-quality devices, and limited access to technical support. These fragilities manifest in delayed or failed digital payments, reliance on cash fallbacks, repeated transaction attempts, and dependence on intermediaries to complete routine exchanges. This context makes the site especially suitable for examining how platform visions of scalability and universality collide with lived conditions of access, literacy, and trust.

Although user-side fieldwork constitutes the empirical core of the study, the analysis is explicitly multi-sided. To contextualize user experiences within broader governance arrangements, the study incorporated a bounded desk-based analysis of institutional and platform materials, including:

- policy documents and circulars issued by the Reserve Bank of India (RBI) and the National Payments Corporation of India (NPCI)
- public government messaging around UPI, Digital India, and financial inclusion
- platform onboarding materials and interface descriptions
- publicly available documentation on UPI's interoperability standards

Participants

The study focuses on marginalized micro-entrepreneurs, defined as family- or community-run enterprises with fewer than ten workers, for whom small-scale trade constitutes a primary livelihood. Participants included artisans and vendors working with textiles, handlooms, jewelry, terracotta, bamboo, and other regionally specific materials.

A total of 21 micro-entrepreneurs participated in the study. Participants varied widely in age, regional background, and digital literacy, ranging from confident smartphone users to individuals reliant on intermediaries for digital transactions. Both men and women vendors were included; while gender was not a sampling criterion, gendered patterns of mediation, trust, and device control emerged during analysis.

Participants were recruited through on-site snowball sampling, beginning with initial vendor contacts and expanding through peer referrals. All participants owned or had access to a mobile phone and were directly involved in managing business transactions.

Data Collection & Analysis

Data was collected through semi-structured qualitative interviews conducted between June and July 2022. Interviews lasted approximately 15–20 minutes and were conducted in Hindi, the participants' primary language. With consent, interviews were audio-recorded and later transcribed into English.

Interview protocols examined everyday payment workflows and transaction practices, including how digital payments were embedded in routine business activities. Interviews explored experiences of trust, fraud, and transaction failure, responses to infrastructural disruptions such as unreliable connectivity, power outages, and device constraints, and reliance on intermediaries or family members. Attention was also given to workarounds and informal practices, as well as participants' perceptions of platform reliability, surveillance, and control, and how these shaped sustained use or resistance.

Analysis followed an iterative thematic and abductive coding process. Interview transcripts were first coded inductively to identify recurring themes related to mediation, infrastructural fragility, agency, trust, and adaptation. These themes were then iteratively compared across participants to surface patterned tensions rather than individual anomalies. In a second analytical phase, these recurring tensions were mapped onto emerging analytical constructs, which were refined through engagement with platform studies, political economy, and development scholarship.

Within the Platform Futures Framework, empirical findings were analytically organized across its four pillars (understood here as analytic domains of evaluation) as follows: Patterns related to policy narratives and platform goals

informed the Vision pillar; infrastructural breakdowns, mediation practices, and user constraints informed the Circumstantial Assessment; recurring divergences between intended and actual use informed Synthesis; and identified points of intervention informed the Action pillar.

Platform Futures Framwork

The Platform Futures Framework is a methodological intervention for analysing fintech and digital payment platforms as future-making infrastructures – that is, as socio-technical systems through which particular visions of participation, development, and inclusion are projected and materially enacted over time. It consists of four analytically distinct pillars. 1) Vision; 2) Circumstantial Assessment; 3) Synthesis; and 4) Actions. Each pillar captures a different stage in the construction, negotiation, and stabilization of platform futures, from their articulation by platform operators and policymakers to their reworking through everyday use. To reduce conceptual overlap and clarify analytic sequencing, the Platform Futures Framework can be understood as a staged methodological process consisting of three phases.

The section proceeds by (1) clarifying the framework's sequencing as three methodological phases, (2) summarising domains, indicators, and data sources in Table 2, and (3) elaborating each analytic domain in turn.

Methodological Phase	Associated Pillar(s)	Analytic Purpose
Phase 1: Framing & Diagnosis	Vision; Circumstantial Assessment	Surfaces projected platform futures and diagnoses the contextual, infrastructural, and user conditions shaping access, mediation, and agency
Phase 2: Analysis	Synthesis	Interprets alignments and divergences between intended platform visions and lived patterns of use, adaptation, and exclusion
Phase 3: Prescription	Actions	Formulates policy, design, and governance interventions aimed at improving inclusion, sustainability, and long-term viability

Table 1: Three methodological phases and associated analytical domains

Within each pillar, the framework specifies a set of indicators that guide analysis, while measures operationalize these indicators through empirical data sources, qualitative prompts, and evaluative criteria. This hierarchical structure makes explicit how futures-oriented claims and assumptions are translated into design choices, governance arrangements, and user experiences distinguishing between analytic domains (pillars), focal elements of assessment (indicators), and empirical operationalization (measures), thereby reducing conceptual overlap and enabling systematic, multi-sided evaluation. This framework evaluates digital platforms across four interlinked dimensions:

1. Platform Vision and Strategic Alignment – assesses the clarity, inclusivity, and contextual fit of the platform's stated purpose, intended beneficiaries, and governance model.
2. Contextual and Infrastructural Conditions – examines enabling and constraining factors such as policy environments, infrastructural readiness, technological dependencies, and the presence of anti-infrastructures.
3. User Experience and Agency – evaluates adoption barriers, mediation practices, accessibility of design, information practices, and the degree to which users can engage autonomously.
4. Governance and Long-Term Sustainability – reviews policy alignment, stakeholder collaboration, trust-building mechanisms, and adaptive strategies for sustaining adoption over time.

These dimensions are assessed both separately – to allow for a targeted diagnosis of gaps – and holistically – to understand how deficiencies in one area may compound others. For example, weak infrastructural readiness may undermine user agency even when the platform vision is well-aligned with local needs. This combined approach ensures that evaluations capture the complex interplay between technical, policy, and socio-cultural factors that determine a platform's viability and sustainability in the Global South. Moreover, it encourages recognition of digital platforms as not only delivery systems but also as instruments of future-making – where multiple, and sometimes conflicting, narratives about inclusion, modernity, and progress are negotiated.

In what follows, I elaborate each analytic domain in sequence – Vision, Circumstantial Assessment, Synthesis, and Action, using Table 2 below as the consolidated reference point for indicators and data sources.

Vision

This pillar corresponds to Phase 1 (Framing & Diagnosis) and focuses on how platform futures are articulated and legitimized.

Vision entails defining the platform's concept by its operators, such as its core purpose, intended users, beneficiaries, and the platform's position within the digital ecosystem. As an analytic construct in the Platform Futures Framework,

"vision" is treated not as a neutral mission statement but as a contested site of future-making that stabilizes particular imaginaries of progress, inclusion, and development while rendering others peripheral or unintelligible. In the context of techno-futures, vision is not merely a technical or managerial objective – it represents a projection of desired futures shaped by specific ideological, political, and economic priorities. Methodologically, foregrounding vision addresses a common blind spot in dominant platform governance and digital inclusion frameworks that operationalize success primarily through uptake, scale, or efficiency, without interrogating how "inclusion" is defined, for whom, and on what normative terms.

Pillar (Analytic Domain)	Sub-Pillars / Variables	What is Assessed	Primary Data Sources	Analytic Role in the Framework
Vision	Platform vision and stated goals; Intended users and beneficiaries; Platform governance model	How platform operators and policymakers articulate projected futures of participation, inclusion, and development	Policy documents; platform texts; public communications; regulatory statements	Framing: surfaces whose futures are imagined, prioritised, and institutionalised
Circumstantial Assessment – Contextual Factors	Platform type; Stakeholders; Infrastructure (Primary / Secondary / Anti-infrastructure); Technologies; Policies (Government / Platform)	Structural, infrastructural, and policy conditions shaping platform use	Policy analysis; infrastructure reports; stakeholder mapping; field observation	Diagnosis: identifies enabling and constraining conditions for platform adoption

Circumstantial Assessment – Users	Resources; Vulnerabilities; Information practices; Mediation (frequency; mediator count; degree of separation; mediator relationship); Agency (dimensions of choice; kind of inclusion)	How users access, navigate, adapt to, or resist platforms in practice	Interviews; ethnographic observation; user narratives	Diagnosis: reveals lived conditions of access, dependency, and autonomy
Synthesis	Alignment or divergence between vision and use; Grassroots adaptations and workarounds; Distribution of benefits and exclusions	How projected platform futures are negotiated, reworked, or contested in everyday use	Cross-analysis of Vision and Circumstantial Assessment findings	Analysis: interprets tensions between intended futures and lived realities
Actions	Policy interventions; Platform design changes; Governance reforms; Partnerships and capacity-building initiatives	Strategies to improve inclusion, sustainability, and long-term viability	Synthesis outputs; stakeholder feedback; comparative cases	Prescription: formulates pathways toward more inclusive and sustainable platform futures

Table 2: Platform Futures Framework — Pillars, indicators, and analytic role

Importantly, universalist inclusion narratives are not exclusive to the Global North; they circulate globally and are also reproduced through nationalist digital modernization agendas, including in India. The issue, therefore, is less geography than the transnational diffusion of a measurement logic that treats access and adoption as proxies for equitable futures. Particularly in Global South contexts, platform visions often encode state-led development narratives, market logics, or digital modernization agendas. In the UPI case, for example, the official vision of a frictionless "cashless" future and formalized financial inclusion sits uneasily

alongside marginalized micro-entrepreneurs' reliance on cash-out practices, intermittent connectivity, and mediated transactions – revealing how the platform's projected future is negotiated and partially reworked in everyday use. Therefore, evaluating "vision" requires not only understanding what the platform aims to achieve but also asking whose futures are being imagined, whose needs are prioritized or neglected, and how these visions are communicated and operationalized.

In the UPI case, platform vision was articulated through RBI and NPCI policy documents that framed digital payments as frictionless, universal, and inherently inclusive within a national financial inclusion agenda (Reserve Bank of India 2019; Reserve Bank of India 2022). However, interviews with micro-entrepreneurs revealed that this projected future assumed uninterrupted connectivity, English-language literacy, and autonomous device use – conditions that did not hold in practice. Many participants described the platform's vision as externally imposed rather than co-produced, encountering it primarily through policy mandates and market pressure rather than meaningful choice.

Circumstantial Assessment

Also part of Phase 1 (Framing & Diagnosis), this pillar maps the contextual and user-side conditions that enable, constrain, or reshape platform futures in practice.

The circumstantial assessment is the broadest area of research, encompassing contextual and user evaluation insights integrated to understand all the critical factors involved in the multisided analysis. As an analytic construct, this pillar responds to a central methodological blind spot in platform governance and digital inclusion research: the tendency to treat context as a background variable rather than as an active force shaping how techno-futures are enabled, constrained, or foreclosed. According to the Digital Inclusion Benchmark Methodology Report by the World Benchmarking Alliance (2020), measurement areas can include evaluating access (availability and affordability), skills (literacy and capabilities), and use (trust building with cybersecurity and privacy). While such benchmarks offer important diagnostics, they often remain static and descriptive, obscuring how infrastructural fragility, policy arrangements, and everyday mediation dynamically condition platform adoption over time. In a techno-futures context, this pillar allows us to examine how the imagined scalability of digital platforms collides with lived realities marked by infrastructural asymmetries, cultural mistrust, and economic precarity. These contextual factors include state policies, platform policies, and the significance of layered infrastructure, which refers to how one infrastructure supports the proliferation of another. Together, these elements not only shape platform functionality but also condition the techno-futures available to different communities – that is, what kinds of participation are possible, and for whom.

Platform Type: As part of the circumstantial assessment, platform type reflects the institutional and governance context within which a platform operates – whether framed around public service delivery, market efficiency, or entrepre-

neurial empowerment – each of which conditions the futures available to marginalized users. In the UPI case, the framing of the system as public digital infrastructure rather than a private fintech product shaped expectations of universality and obligation, even where local conditions made such expectations difficult to fulfil.

Stakeholders: Understanding who holds power, how it is exercised, and its impact on users is crucial for a comprehensive political economy analysis. This also helps reveal how governance coalitions (public, private, hybrid) consolidate or fragment control over how digital futures are designed, financed, and accessed.

Infrastructure: Platforms are designed over multiple infrastructures. Evaluating this factor helps highlight infrastructural prerequisites to support a digital platform in the region or area of launch. I also recommended evaluating an anti-infrastructure category that expands to include the operational challenges posed by limited infrastructure. Anti-infrastructure refers to absent, unreliable, or fragile systems such as unstable internet, inconsistent electricity, or a lack of affordable devices, which must be mapped out to anticipate points of failure. Conceptualizing anti-infrastructure as an analytic category shifts attention away from individual "adoption failure" toward structural conditions that systematically constrain platform participation. For example, in remote Indian villages, power cuts can interrupt UPI transactions or prevent real-time syncing

From a techno-futures perspective, this makes visible how future-oriented platform promises are unevenly distributed across space, rendering some populations perpetually "not yet ready" for the futures platforms presume. Accounting for anti-infrastructures foregrounds the contingent and uneven nature of techno-futures in the Global South – reminding us that what is "future-ready" in one setting may be unworkable or exclusionary in another.

Technologies: Platforms depend on layered technologies. I recognize and divide the layers of technologies needed to access a platform into primary and secondary technologies. Primary technologies include end-user devices; secondary technologies include connectivity services. Treating technology access as layered counters the implicit assumption in many platform visions that devices, connectivity, and digital literacy co-exist uniformly. Dominant platform visions often presume universal device access, digital fluency, and reliable connectivity – assumptions that can marginalize users lacking these prerequisites. Assessing technology access through this layered lens surfaces inequities that must be addressed to imagine more equitable digital futures.

Policies and Governance: Finally, various stakeholders' policies condition platforms, infrastructures, and technologies. Government and platform policies condition how platforms are accessed, governed, and experienced. Beyond formal governance models, this indicator examines (a) policy silences and enforcement gaps, (b) state–platform alignments that shape platform priorities, and (c) the distribution of risk, responsibility, and accountability across users, intermediaries, platforms, and the state.

For instance, India's UPI operates under a state-led public governance model managed by the Reserve Bank of India (RBI) and the National Payments Corporation of India (NPCI), with policies emphasizing interoperability, zero merchant discount rates, and public accessibility. In contrast, privately operated fintech platforms like Paytm, PhonePe, or Google Pay operate under corporate governance structures, balancing compliance with RBI regulations while prioritizing competitive differentiation, revenue generation, and proprietary features. Hybrid governance models also exist – where public and private entities collaborate on infrastructure but retain separate operational mandates.

Collaborative governance models can strengthen sustainability, for example, such outcomes could be pursued through joint initiatives in which institutions like the RBI and NPCI partner with local NGOs, microfinance institutions, or digital literacy programs to design culturally tailored onboarding materials and fraud-prevention campaigns. Such arrangements blend state regulatory oversight with grassroots trust networks, increasing adoption and long-term retention among marginalized users. Ultimately, governance shapes not only how platforms function, but how digital futures are imagined – whether as centralized and scalable, or plural and locally negotiated.

UPI governance illustrates how state–platform alignment can coexist with accountability gaps. While RBI and NPCI policies promote interoperability and low-cost access, participants reported uncertainty around grievance redress, fraud liability, and transaction reversal. In practice, responsibility for managing risk was frequently displaced onto users or informal mediators, who absorbed losses, navigated disputes, or provided trust labour without institutional support. This reveals how governance operates not only through formal policy design, but through silences that redistribute risk downward – shaping which digital futures are viable for marginalized users.

Users

The circumstantial assessment in my framework also includes understanding platform users' 1) resources and vulnerabilities; 2) information practices; 3) need for mediation to use a platform; and 4) level of agency and empowerment. This user-focused analysis addresses a persistent blind spot in platform evaluation frameworks that conflate inclusion with use, without accounting for the conditions under which use is enabled, mediated, or constrained.

Resources and Vulnerabilities: To assess platform sustainability, it is vital to understand any local cultural norms and contextual misalignments. Platform user evaluation can be informed by quantitative indicators such as adoption rates and transaction volumes. The vulnerabilities can be due to societal challenges such as a lack of internet infrastructure. These vulnerabilities are not merely logistical constraints; they actively shape which techno-futures become accessible, deferred, or foreclosed for marginalized users.

Information Practices: The assessment of vulnerabilities can shed light on users' current information practices. Users' information resources and associated practices vary based on policies, social context, and the history of a particular platform in that region. In many cases, information practices are also shaped by historical and cultural ways of knowing, which may clash with how platforms assume users search, verify, or trust digital content – thus reshaping future participation. In the UPI context, informal knowledge-sharing networks often substituted for formal onboarding processes, revealing how users collectively navigated uncertainty in the absence of institutional support.

Mediation: Mediation occurs when users rely on others to access or operate a platform. In the UPI context, older artisans may depend on younger relatives for transactions, or women entrepreneurs on male family members for navigating English-language menus. Evaluating mediation means asking how often mediation occurs, who the mediators are, and how many mediators are involved. While it can overcome immediate barriers like low literacy or unfamiliarity with digital interfaces, it may also create dependency, reduce agency, expose users to risks such as fraud or privacy breaches, and limit opportunities for skill-building and autonomous use. Treating mediation as an analytic category – rather than as a temporary workaround – reveals how platforms implicitly rely on social labour to compensate for design and infrastructural gaps, thereby redistributing risk onto marginalized users.

Agency: While mediation underscores inequalities, agency underscores autonomy. For users who do not rely on mediation, it is vital to understand their self-evaluation of freedom. Agency factor evaluates a user's freedom and autonomy when choosing and using a digital platform. Are the users included in all dimensions – social, digital, and financial? If yes, is inclusion making a difference in their lives? Does digital inclusion allow users to improve their lives or socio-economic status? It is important to note that inclusion does not translate to empowerment. The more power users have to choose for themselves and the greater their capability to utilize the platform, the greater their inclusion in the digital ecosystem.

Fieldwork at Shilparamam revealed that UPI use was deeply conditioned by infrastructural and social circumstances rather than individual preference. Transaction failures due to power outages, unstable connectivity, and low-end devices were common, leading users to rely on intermediaries or to restrict UPI use to cash-out transactions. Women vendors, in particular, often depended on male relatives to operate the platform, highlighting how mediation compensated for design and infrastructural gaps while redistributing risk and control. These findings demonstrate that adoption cannot be meaningfully assessed without accounting for anti-infrastructures, mediated access, and uneven agency – conditions that actively shape which digital futures become feasible or foreclosed for marginalized users.

Synthesis

Within the Platform Futures Framework, Synthesis functions as the interpretive stage of analysis, drawing together empirical insights generated through the Vision and Circumstantial Assessment pillars to examine alignments, divergences, and contested futures. As Phase 2 (Analysis), Synthesis interprets how findings from Vision and Circumstantial Assessment converge or diverge.

Synthesis entails breaking down information and combining insights to form solutions or new ideas. As an analytic construct within the Platform Futures Framework, synthesis addresses a key methodological blind spot in platform evaluation: the tendency to treat misalignment between platform design and user practice as implementation failure rather than as analytically meaningful evidence of contested futures (Suchman 2007; Jasanoff/Kim 2015). I synthesized essentials from the circumstantial assessment and provided insight into platforms' attempts to implement their vision. Methodologically, this pillar functions as the interpretive hinge of the framework, where empirical findings from context and user analysis are brought into dialogue with platform visions and governance arrangements.

Synthesis helps assess whether a platform's stated vision matches how it is used and experienced at the grassroots level. Rather than assuming convergence between intention and outcome, this stage foregrounds divergence as a diagnostic signal – revealing where platforms are reinterpreted, selectively adopted, or strategically bypassed. It is essential to highlight any contingencies, novelties of use, or path-dependencies here. How is the platform's transactional space generating new norms? Identifying fixable and non-fixable issues, or the level of fixability from a developmental perspective, is also crucial to negating inequalities. This analytic move shifts attention from whether platforms "work" to how they are made workable under uneven conditions.

This stage is particularly important for identifying where hegemonic techno-futures – those envisioned by platform designers, governments, or funders – encounter resistance, adaptation, or transformation in local contexts. In contrast to dominant platform governance and evaluation approaches that interpret deviation from intended use as market failure or user deficit, synthesis treats such deviations as evidence of plural and situated techno-futures emerging from below. This attention to divergence challenges evaluation logics that privilege seamless uptake and standardized use over situated adaptation and mediation. In the UPI case, practices such as cash-out-only usage, family-based mediation, or the parallel use of WhatsApp commerce illustrate how users selectively appropriate platform functionality to align with existing economic rhythms and trust relations, producing futures that coexist with – but do not fully conform to – state-led cashless imaginaries.

Furthermore, I focus on synthesizing how policies and platform governance structures may favour specific stakeholders over others, potentially perpetu-

ating inequalities despite efforts toward inclusion. For a more holistic synthesis, I explicitly integrated an analysis of government and private stakeholders' roles. Here, governance models play a decisive role: state-led arrangements often project futures of national modernization and universal access, but may overlook local readiness; private or corporate governance tends to prioritize growth and competition, producing futures tied to market logics; while hybrid governance can open space for plural trajectories by combining state oversight with grassroots or civil society collaboration (Plantin et al. 2018), such as partnerships between regulatory bodies, platform operators, and intermediary organizations including NGOs, self-help groups, or local financial institutions involved in onboarding, mediation, or capacity-building. Synthesis thus makes visible how governance choices stabilize futures while rendering others informal, temporary, or unsupported.

Synthesis also considers how information, telecom infrastructure, education, social services, economics, labour, and other government policies, combined with platform policies, can influence platform use at the grassroots level. By bringing these domains into a single analytic frame, synthesis captures how techno-futures are co-produced across sectors rather than determined by platform design alone. These structural components can either enable plural techno-futures – by adapting to local conditions and feedback – or entrench a singular, often exclusionary, trajectory of digital transformation.

Synthesis also considers platform operators' social responsibility initiatives as an evaluation criterion. For example, examining how platforms respond to unplanned or informal usage – such as WhatsApp commerce or voice-based mediation – can reveal whether they are willing to evolve their design in response to alternative digital futures rather than force conformity to a default model. Here, responsiveness to informal or emergent practices becomes an indicator of whether platforms are capable of futures-oriented adaptability rather than rigid standardization. This approach can help propose policy amendments that promote social justice in platform inclusion and sustainability. Ultimately, synthesis is the stage where the multiplicity of lived techno-futures becomes visible, offering a critical space to reimagine platform governance not just in terms of performance or uptake, but in terms of cultural fit, equity, and futures-oriented adaptability.

In the UPI case, divergence between policy intent and everyday use did not take the form of outright rejection but of selective appropriation. Many micro-entrepreneurs used UPI only to receive payments while maintaining cash-based accounting practices or parallel WhatsApp commerce. Rather than signaling failure, these adaptations reflected pragmatic negotiations of trust, liquidity, and risk under constrained conditions. Treating such divergences as analytically meaningful – rather than as noise – reveals how grassroots actors actively rework platform futures, producing hybrid trajectories that coexist with, but do not fully align with, state-led cashless imaginaries.

Action

To clarify its analytical depth, the Action pillar is structured across four interrelated layers, moving from governance responsibilities to futures-oriented intervention. As Phase 3 (Prescription), Action translates the preceding diagnosis and synthesis into futures-oriented interventions and accountability strategies.

1. Governance Responsibilities and Risk Redistribution

From a governance perspective, action must address not only inclusion mechanisms but also the redistribution of risk and responsibility – clarifying liability, strengthening grievance redress, and reducing reliance on informal mediation as a substitute for institutional accountability. The United Nations ESCAP (Economic and Social Commission for Asia and the Pacific) report highlights infrastructural development, policy interventions, and localized solutions as strategies to address digital inclusion challenges (2020). Within the Platform Futures Framework, "Action" is conceptualized not as a prescriptive endpoint, but as an analytic site where evaluative insights are translated into futures-oriented intervention. Based on a synthesis of platform vision and circumstantial assessment, the last step in this framework is to prescribe actionable solutions that can serve as a roadmap for implementing a digital platform's adoption among marginalized users. Methodologically, this pillar addresses a recurring blind spot in platform governance research: the assumption that evaluation ends with diagnosis, rather than extending into questions of responsibility, adaptability, and long-term futures stewardship. It is vital to recognize which factors are easily adaptable for users and how those on the periphery can be included. Crucially, this step asks: What kind of digital future is being materially supported by platform design and governance – and what kinds of futures are being marginalized, delayed, or excluded?

2. Sustainability and Long-Term Engagement

It is also crucial to establish that platform operators ensure long-term engagement beyond the initial adoption phase. Foregrounding sustainability as an analytic concern counters adoption-centric models that treat initial uptake as success, while neglecting whether platforms remain usable, trustworthy, and meaningful over time. Actionable solutions should include a plan for the sustainability of digital platforms; for example, proposals for public policymaking and policy amendments, platform policies, partnerships with local organizations, or iterative user feedback loops. In the UPI context, the uneven durability of adoption – where users register but revert to cash or mediated use – illustrates the importance of sustained institutional support beyond onboarding.

Unlike universalist Western policy prescriptions that prioritize technical fixes, these strategies foreground co-governance and trust-building as essential to sustaining inclusive futures in the Global South. Rather than assuming that design improvements alone can resolve exclusion, this pillar emphasizes rela-

tional and institutional interventions that redistribute responsibility across states, platform operators, and intermediary actors.

3. Designing for Mediation and Dependency

Insight into the risks and privacy concerns associated with mediation should be addressed further in the context of platform design. For instance, platforms should provide direct support or alternative features for users who rely on intermediaries. This is especially important in contexts where informal assistance has become normalized, revealing a disconnect between platform functionality and users' actual pathways of access and agency. Treating mediation as a long-term condition rather than a transitional flaw allows action strategies to anticipate dependency, risk transfer, and privacy erosion as structural concerns rather than user-level failures.

4. Futures-Oriented Interventions and Co-Governance

Actionable solutions focused on strategizing adaptation mechanisms for users' better navigation of the platform would allow for more organic learning and troubleshooting. As Brown and Mickelson (2019) advise, paying heed to training and capacity-building efforts for community members can increase the sustainability of ICT interventions. Further solutions, therefore, include educational initiatives and gender-equality measures, such as addressing systemic barriers to increase the participation of women in ICT fields (United Nations ESCAP 2020: 67-69). Platform operators can also promote open, ethical, and sustainable development innovation to ensure sustainability (World Benchmarking Alliance 2020: 14-18) and encourage open innovation for collaboration, interoperability, and transparency in their business models. Ethical development requires specifying concrete data practices rather than relying on abstract principles. In this context, fair data practices include transparency around data collection and use, limits on secondary data sharing, and consent mechanisms that are meaningful for users with uneven digital literacy. Privacy protection involves minimizing unnecessary personal data exposure, securing authentication processes, enabling user control over transaction histories, and preventing misuse by intermediaries in mediated transactions. Together, these practices address structural risks in platform use rather than assuming trust emerges automatically from ethical intent.

Sustainable innovation, in turn, involves creating environmentally and socially responsible digital solutions through equitable platform governance. This includes adaptive policy frameworks, institutional accountability, and design choices that support long-term usability and maintenance, rather than privileging short-term adoption or efficiency metrics alone.

Viewed through a techno-futures lens, these actions are not merely corrective measures but mechanisms for co-producing alternative platform trajectories – ones that remain responsive to marginalized users' evolving needs, aspirations, and constraints. Taken together, these actions enable the co-production of more

just and inclusive techno-futures – ones shaped not only by platform creators and policymakers, but by the everyday expertise and aspirations of marginalized users.

The uneven durability of UPI adoption among marginalized users underscores the need to treat action as a futures-oriented intervention rather than a technical fix. While government-led training initiatives existed, participants reported limited follow-up support, weak grievance redressal, and persistent reliance on intermediaries. These conditions suggest that without sustained co-governance, infrastructural investment, and design for mediated use, platforms risk stabilizing a singular techno-future that privileges efficiency over equity. The Action pillar thus emerges directly from UPI's partial successes and persistent exclusions, foregrounding the responsibility of institutions to support plural and durable platform futures.

Operationalising the Platform Futures Framework: Application Toolkit

Having defined the four analytic domains, I now turn from conceptual architecture to operationalization. The toolkit below translates each domain into indicators, guiding questions, data collection methods, and scoring criteria to support repeatable application.

The application toolkit operationalizes the framework components summarized in Table 2 by translating each pillar and indicator into guiding questions, data collection methods, and evaluative criteria.

Building on the analytic pillars outlined above, this section translates the Platform Futures Framework into an applied evaluation toolkit. The toolkit operationalizes each pillar through indicators, guiding questions, data collection methods, and scoring criteria, enabling comparative and context-sensitive assessment without reducing the framework to a purely instrumental checklist.

To operationalize this framework, I have developed a practical evaluation toolkit that translates each pillar into a set of applied assessment components. The toolkit represents one possible operationalization of the Platform Futures Framework; its purpose is illustrative rather than exhaustive. The toolkit is organized into four categories:

1. *Indicators* specify the key technical, socio-cultural, and governance-related aspects of each pillar that require evaluation.
2. *Sample questions* provide guiding prompts to investigate each indicator, allowing evaluators to adapt inquiry to the specific platform, user group, and local context.
3. *Data collection methods* outline recommended qualitative and quantitative techniques – such as policy analysis, interviews, focus groups, surveys, infrastructure mapping, and platform walkthroughs – to generate evidence across institutional and user domains. Integrating narrative and metrics-based data is essential for tracing how projected futures are enacted in practice.

4. *Scoring guidelines* employ a standardized 1–5 scale to support comparative analysis across platforms and enable longitudinal tracking of changes in inclusivity and sustainability over time.

By pairing each pillar with these four components, the toolkit bridges conceptual design with field-level application, creating a repeatable and transparent evaluation process.

1. Vision – Projected Futures and Normative Orientation
Indicators • Articulated future imaginary • Normative assumptions about users and access • Recognition of marginalized users in future narratives • Alignment between vision and context
Sample Questions • Is the platform's vision documented and public? • To what extent does the projected future acknowledge local socio-economic conditions, infrastructural constraints, or mediated access? How does the platform's vision frame inclusion (e.g., universal access, formalisation, efficiency), and what assumptions does it make about users' capacities? Whose needs and aspirations are prioritized in the platform's future vision?
Data Collection Methods • Review strategic plans, policy docs, press releases, official website • Interviews with platform leadership • Content analysis of public materials
Scoring Guidelines (1–5) 1: Vision is generic or absent; assumes universal access, autonomous users, and seamless adoption 3: Vision references inclusion but only partially accounts for contextual constraints and differentiated user capacities 5: Vision articulates a context-sensitive future that recognises infrastructural precarity, mediated access, and heterogeneous users

2. Circumstantial Assessment – Contextual Factors & Users
Indicators • Access stack: infrastructure and technologies • Policy environment, enforcement gaps, accountability distribution • Anti-infrastructure and failure modes • Allocation of risk and responsibility (fraud, failure, redress) • Technology prerequisites & affordability • Stakeholder mapping & power balance • User resources, vulnerabilities & agency • Socio-cultural tensions between formal platforms and informal practices • Mediation and intermediaries

Sample Questions

- What elements of the access stack enable or constrain routine platform use?
- How do policy and governance arrangements shape participation, terms of access, and exposure to risk?
- Which user resources and vulnerabilities most condition engagement?
- How do anti-infrastructure conditions surface in everyday use or transaction failure?
- Where do platform assumptions diverge from observed practices or informal adaptations?
- How does mediation redistribute access, control, trust, and risk?
- Where are policy responsibilities unclear or informally delegated?
- When failures or fraud occur, who bears risk and accountability?
- How do state–platform alignments shape priorities and whose interests are sidelined?

Data Collection Methods

- Policy analysis
- Telecom/infrastructure reports
- Community surveys & focus groups
- Stakeholder interviews
- Ethnographic mapping of everyday use and resistance

Scoring Guidelines (1–5)

1: Severe infrastructural, policy, or social constraints; use highly mediated with no mitigation
3: Persistent constraints; partial adaptations enable uneven use
5: Supportive conditions; reliable access stacks and low mediation reliance

3. Synthesis – Alignment of Vision & Reality

Indicators

- Alignment between vision & actual use
- Evidence of grassroots adaptation
- Equity of benefits across groups
- Recognition of informal use, resistance, or repurposing

Sample Questions

- Are marginalized users benefiting as intended?
- What unplanned uses have emerged?
- Do policies/designs favour certain groups?
- How do users adapt or resist the platform?

Data Collection Methods

- Usage analytics
- Ethnographic observations
- Interviews with diverse user groups
- Analysis of workarounds and informal infrastructures

Scoring Guidelines (1–5)

1: Complete divergence; inequitable benefits
3: Partial alignment; mixed equity outcomes
5: Strong alignment; equitable and widespread benefits

4. Actions – Inclusion & Sustainability Strategies
Indicators • Concrete measures to address gaps • User engagement & feedback loops • Long-term sustainability planning • Co-creation and participatory governance • Redress mechanisms for harms
Sample Questions • Are onboarding programs in place? • Is there a long-term sustainability plan? • How is user feedback integrated? • Are marginalized users engaged in co-design? • Are there channels to address exclusion risks?
Data Collection Methods • Review platform roadmaps & partner reports • Analysis of NGO/government collaborations • User feedback surveys • Participatory design workshops or audits
Scoring Guidelines (1–5) 1: No action plan; short-term fixes 3: Some measures; limited feedback integration 5: Comprehensive, sustained strategies with measurable outcomes

Scoring and Comparison

To generate an overall evaluation, scores from all four pillars can be averaged to produce a Platform Inclusion / Sustainability Index (PISI), which is adapted from methodology design principles for composite indices in platform evaluation contexts (OECD 2008). This composite score offers an interpretive summary of how a platform performs across the framework's analytic pillars, supporting within-case reflection and comparative reasoning when applied consistently across contexts. Importantly, the index does not merely quantify platform performance – it offers a lens within platform development and adoption.

While the pillars can be equally weighted for a balanced assessment, evaluators may adjust the weighting to reflect specific priorities or contexts – for example, assigning greater weight to Circumstantial Assessment in regions where infrastructural readiness is a primary barrier, or to Actions when long-term sustainability planning is the key concern. This flexibility enables the framework to remain sensitive to context-specific constraints and evaluative priorities, rather than imposing a universal hierarchy of concerns.

Interpreting PISI Scores

- 4.5–5.0 – Strong inclusivity, contextual fit, and sustainable governance. The platform actively supports plural techno-futures, including those shaped by marginalized users' practices and aspirations.
- 3.5–4.4 – Generally aligned with local conditions but with identifiable gaps. The platform may still privilege dominant development narratives, with only partial accommodation of alternative or grassroots futures.
- 2.5–3.4 – Mixed performance with significant barriers to marginalized inclusion. Projected platform futures are misaligned with lived conditions, prompting informal adaptation or resistant use.
- Below 2.5 – Low inclusivity and weak sustainability. The platform reinforces a singular, exclusionary techno-future and is likely to deepen inequality without substantial redesign or policy intervention.

Validation Strategy

The Platform Futures Framework is validated through analytic coherence, empirical grounding, and interpretive robustness, rather than predictive accuracy or statistical generalization. Given the framework's qualitative and future-oriented orientation, validation is approached as an iterative process that tests the clarity, applicability, and explanatory power of its analytic constructs across empirical materials.

Interpretive Consistency and Analytic Reliability

Interpretive consistency was assessed through repeated analytic passes over the same empirical materials at different stages of framework development. Interview transcripts and documentary sources were revisited as the framework's pillars and indicators were refined, allowing for comparison of interpretations over time and ensuring that analytic distinctions remained stable and meaningful. Formal inter-rater reliability testing (such as Cohen's Kappa) is proposed as a next step for future comparative applications.

Practitioner Grounding and Epistemic Validity

The framework was iteratively refined through sustained engagement with platform governance, development, and political economy literatures. This grounding helped ensure that the indicators remain legible to real-world evaluators while retaining critical sensitivity to power, mediation, and infrastructural constraint.

Validation is thus conceived as an ongoing, reflexive process rather than a one-time test. In the following section, the framework is applied to the case

of India's Unified Payments Interface (UPI) as an illustrative demonstration, showing how the framework's pillars and indicators can be operationalized using available qualitative and documentary evidence.

Demonstration Toolkit Test Case: India's Unified Payment Interface (UPI)

I apply the toolkit in the same sequence as the framework's phases – Vision and Circumstantial Assessment (diagnosis), Synthesis (analysis), and Action (prescription) – and then aggregate scores into an illustrative PISI.

This section presents an illustrative demonstration of the Platform Futures Framework through the case of India's Unified Payments Interface (UPI) to show how the framework's pillars and indicators can be operationalized using available qualitative and documentary evidence. The tables below apply the toolkit exhaustively to UPI by scoring each indicator (1–5) using the qualitative and documentary evidence available in this study. The four tables below score every indicator listed in the toolkit, enabling a transparent, end-to-end demonstration of the framework across all analytic domains.

Vision – Projected Futures and Normative Orientation

Indicator	Score (1–5)	Evidence-based justification (1–2 lines)
Articulated future imaginary	4	RBI/NPCI documents clearly articulate interoperability, scale, and inclusion as a national payments future.
Normative assumptions about users and access	2	The vision assumes reliable connectivity, English-language literacy, and autonomous device use—conditions interviews show do not hold consistently.
Recognition of marginalized users in future narratives	3	"Inclusion" is invoked in policy terms, but lived conditions of mediated use and low literacy are weakly specified in official imaginaries.
Alignment between vision and context	3	Alignment is partial: UPI enables QR transactions and benefit flows, but infrastructural precarity and mediation limit realization of the "frictionless" future.

Vision pillar average: 3.0

Circumstantial Assessment – Access Stack, Mediation, and User Vulnerabilities

Indicator	Score (1–5)	Evidence-based justification (1–2 lines)
Access stack (infrastructure + technologies)	3	Uneven connectivity, unreliable electricity, low-end/shared devices; usage is possible but inconsistent in routine trade.
Policy environment, enforcement gaps, accountability distribution	3	Strong top-down policy support exists, but users report uncertainty around grievance redress, reversals, and liability—an enforcement/accountability gap.
Anti-infrastructure and failure modes	2	Transaction failures and delays recur with power/connectivity instability, producing repeated attempts and reliance on cash fallback.
Allocation of risk and responsibility (fraud, failure, redress)	2	Responsibility for managing breakdowns/fraud is displaced downward to users/intermediaries; weak redress clarity in lived experience.
Technology prerequisites & affordability	2	Device affordability/quality constraints and literacy/language barriers materially limit autonomous use; users rely on mediators or restrict usage to cash-out.
Stakeholder mapping & power balance	3	Governance is state-led (RBI/NPCI) with strong platform ecosystem actors, but user-side power is limited; dependence on intermediaries indicates asymmetric control.
User resources, vulnerabilities & agency	2	Low literacy, uneven skills, and gendered device control constrain agency; autonomy varies sharply across users.
Socio-cultural tensions (formal platform vs informal practices)	3	Users sustain cash-based rhythms/accounting and selective digital use; the platform coexists with informal practices rather than replacing them.
Mediation and intermediaries	2	Mediation is frequent (family-based, gendered, age-linked), redistributing control and increasing privacy/fraud exposure.

Circumstantial Assessment average: 2.44

Synthesis – Divergence Between Vision and Practice

Indicator	Score (1–5)	Evidence-based justification (1–2 lines)
Alignment between vision and actual use	3	Partial alignment: UPI works for receiving payments, but "frictionless universality" is undercut by failures, mediation, and cash fallback.
Evidence of grassroots adaptation	4	Cash-out-only use, WhatsApp commerce, and mediated transactions demonstrate robust user-side adaptation and workarounds.
Equity of benefits across groups	2	Evidence indicates uneven outcomes by literacy, gender, and device control; marginalized micro-entrepreneurs face disproportionate constraints.
Recognition of informal use/resistance/repurposing	3	Informal and mediated practices are central in use, but institutional accommodation appears partial and uneven (based on user reports of limited support).

Synthesis average: 3.0

Actions – Accountability, Risk, and Sustainability

Indicator	Score (1–5)	Evidence-based justification (1–2 lines)
Concrete measures to address gaps	3	Training initiatives exist, but follow-up support is limited; key gaps (fraud/redress/mediated use) persist.
User engagement & feedback loops	2	Participants report weak ongoing support and limited mechanisms to resolve routine breakdowns; feedback integration is not evident in user experience.
Long-term planning for sustainability	2	"Durability of adoption" is uneven (reversion to cash/mediation); sustained institutional support beyond onboarding appears weak.
Co-creation / participatory governance models	2	Users experience the system as imposed via mandates/market pressure rather than co-produced; participatory channels are not visible in field accounts.
Redress mechanisms for harms/exclusions	2	Unclear grievance redress and liability are repeatedly flagged by participants; risk is effectively privatized onto users/intermediaries.

Actions average: 2.2

Illustrative aggregation

Using equal weights across pillars, the illustrative PISI is:

- *Vision (3.0)*
- *Circumstantial (2.44)*
- *Synthesis (3.0)*
- *Actions (2.2)*
- *Overall (mean): 2.66*

Taken together, the indicator-level scores yield an overall mean of 2.66, placing UPI within the framework's "mixed performance" band (2.5–3.4). As defined in the toolkit, this band reflects partial realization of platform goals, where core functionalities are operational but unevenly sustained, and where inclusion and long-term viability remain shaped by mediation, infrastructural fragility, and institutional support. Scores are illustrative and transparently justified; future applications can adjust weights or add institutional datasets while preserving the indicator set.

In substantive terms, the UPI case reflects a mixed performance: a highly articulated state-led future of interoperability and inclusion is partially realized in practice, but uneven infrastructure, mediated access, and weak accountability mechanisms constrain durable, equitable uptake among marginalized micro-entrepreneurs.

Read together, the indicator-level scores demonstrate how weaknesses cluster across analytic domains rather than remaining confined to a single stage of platform operation. The recurrence of lower scores in circumstantial assessment, synthesis, and action indicates that constraints compound over time, shaping trajectories of use and durability rather than producing discrete points of failure. This cross-pillar pattern underscores the value of evaluating platforms as future-making infrastructures, where early design and governance assumptions propagate downstream effects on sustainability and inclusion. The demonstration thus highlights how the framework makes visible temporal and structural dependencies that are often obscured in adoption-focused evaluations.

Limitations

The Platform Futures Framework is intentionally designed for Global South contexts characterized by infrastructural precarity, governance asymmetries, and socio-cultural heterogeneity. While its analytic logic may be transferable, its indicators and evaluative emphasis are most directly suited to settings where platforms operate as uneven and contested infrastructures rather than stable services.

Indicator-level scoring within the framework is inherently interpretive. Scores are derived from qualitative evidence, policy analysis, and contextual judgment

rather than standardized metrics, and are intended to be illustrative – highlighting patterns of alignment and tension rather than producing universal rankings.

Finally, as a futures-oriented methodological intervention, the framework prioritizes projected trajectories and conditions of durability over longitudinal outcomes. This enables anticipatory evaluation, while acknowledging that assessments may shift as infrastructures, governance arrangements, and user practices evolve over time.

Conclusion

This article advances the Platform Futures Framework as a methodological contribution to platform governance and digital inclusion research, offering a context-sensitive, multisided approach to analysing digital platforms as future-making infrastructures. Beyond its academic value, the framework provides policymakers with a structured way to examine how platform governance choices shape durable and exclusionary futures. Moving past adoption-based and user-centred evaluations, it integrates insights from political economy, development studies, and platform studies to foreground power asymmetries, infrastructural dependencies, and mediated access. By operationalising these dimensions through indicator-level assessment and illustrative scoring, the framework renders evaluative judgments about platform futures transparent, comparable, and reflexive rather than implicit or ad hoc.

Derived inductively from qualitative fieldwork on India's Unified Payments Interface (UPI), the framework demonstrates how state-led visions of digital modernization are negotiated, adapted, and resisted in everyday platform use. The UPI case illustrates how applying the framework across all analytic pillars reveals uneven performance patterns, where core functionalities coexist with infrastructural fragility, mediated access, and limited institutional support. Rather than treating divergence from intended use as failure, the framework reframes such moments as analytically productive sites where plural and contested techno-futures emerge.

Methodologically, the Platform Futures Framework is both empirically grounded and analytically portable. Its four pillars – Vision, Circumstantial Assessment, Synthesis, and Action – translate recurring empirical tensions into constructs that travel across platform contexts while remaining sensitive to local variation. Applied sequentially, these pillars position the framework as a futures-oriented evaluative process rather than a static classification scheme.

While relevant to policymakers and platform operators, the framework's primary contribution lies in reframing how platform sustainability and inclusion are studied. By positioning marginalized users not as lagging adopters but as agents with situated expertise, it challenges dominant evaluative paradigms and opens space for analysing how more just and inclusive techno-futures might be

co-produced. The central methodological insight is clear: evaluating platforms requires attention not only to adoption, but to whose futures are enabled, constrained, or reimagined – and how these futures are differentially stabilized or undermined through governance, infrastructure, and everyday practice.

References

Athique, Adrian/Parthasarathi, Vibodh (2020): Platform Capitalism in India. Global Transformations in Media and Communication Research - A Palgrave and IAMCR Series, Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-44563-8_1.

Bhatia, Kiran V. (2023): "Bottom-up Imaginaries: Examining Discursive Construction of Social Media Roles and Affordances in India." In: Contemporary South Asia 31/2, pp. 251-267. https://doi.org/10.1080/09584935.2023.2206996.

Bouquillion, Philippe (2023): "The Big Five in India, Powerful Players?" In: Philippe Bouquillion, Cécile Ithurbide and Tristan Mattelart (eds.), Digital Platforms and the Global South: Reconfiguring Power Relations in the Cultural Industries, London: Routledge.

Bouquillion, Philippe/Ithurbide, Cécile/Mattelart, Tristan (2023): Digital Platforms and the Global South: Reconfiguring Power Relations in the Cultural Industries, London: Routledge.

Brown, Susan/Mickelson, Andrea (2019): "Why Some Well-Planned and Community-Based ICTD Interventions Fail." In: Information Technologies and International Development 15/15, pp. 49-61. https://itidjournal.org/index.php/itid/article/download/1706/1706-5259-1-PB.pdf.

Cohen, Jacob (1960): "A Coefficient of Agreement for Nominal Scales." In: Educational and Psychological Measurement 20/1, pp. 37-46. https://doi.org/10.1177/001316446002000104.

Coyle, Diane (2018): "Platform Dominance." In: Martin Moore/Damian Tambini (eds.), Digital Dominance: The Power of Google, Amazon, Facebook, and Apple, Oxford: Oxford University, pp. 21-44.

Duncombe, Richard (2006): "Using the Livelihoods Framework to analyse ICT Applications for Poverty Reduction through Microenterprise." In: Information Technologies and International Development 3/3, pp. 81-100.

The Economic Times. (2024, August 27). UPI crosses 20 billion transactions in August, records ₹24.85 lakh crore value. https://economictimes.indiatimes.com/industry/banking/finance/banking/upi-crosses-20-billion-transactions-in-august-records-24-85-lakh-crore-value/articleshow/123633627.cms.

Evans, David S./Schmalensee, Richard (2016): Matchmakers: The New Economics of Multisided Platforms, Boston: Harvard Business Review.

Fleiss, Joseph L. (1971): "Measuring Nominal Scale Agreement among Many Raters." Psychological Bulletin 76/5, pp. 378-382. https://doi.org/10.1037/h0031619.

Gorwa, Robert (2019): "What Is Platform Governance?" In: Information, Communication & Society 22/6, pp. 854-871. https://doi.org/10.1080/1369118X.2019.1573914.

Goswami, Himakshi (2016): "Opportunities and Challenges of Digital India Programme." In: International Education & Research Journal 2/11, pp. 78-79.

Helberger, Natali/Pierson, Jo/Poell, Thomas (2018): "Governing Online Platforms: From Contested to Cooperative Responsibility." In: The Information Society 34/1, pp. 1-14. https://doi.org/10.1080/01972243.2017.1391913.

Jasanoff, Sheila and Sang-Hyun Kim (eds.) (2015): Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power, Chicago: University of Chicago.

Jin, Dal Yong (2015): Digital Platforms, Imperialism and Political Culture, New York: Routledge.

Kleine, Dorothea (2019): "A Decade of Applying the Capabilities Approach via the Choice Framework: Practical Tools and Critical Reflections." In: Proceedings of the 2019 HDCA Conference. Human Development and Capability Association. http://eprints.whiterose.ac.uk/157682/1/Kleine%20HDCA2019%20CF%20Practical%20Tools.pdf.

Larkin, Brian (2013): "The Politics and Poetics of Infrastructure." In: Annual Review of Anthropology 42, pp. 327-343. https://doi.org/10.1146/annurev-anthro-092412-155522

Langley, Paul/Leyshon, Andrew (2021): "The Platform Political Economy of FinTech: Reintermediation, Consolidation and Capitalisation." In: New Political Economy 26/3, pp. 376-388. https://doi.org/10.1080/13563467.2020.1766432.

Mukherjee, Rahul. (2019): "Jio Sparks: Infrastructural Imaginaries and Platformization in India." In: Media, Culture & Society 41/2, pp. 175-190. https://doi.org/10.1177/0163443718818376.

Organisation for Economic Co-operation and Development (OECD) (2008): Handbook on Constructing Composite Indicators: Methodology and User Guide, Paris: OECD Publishing. https://doi.org/10.1787/9789264043466-en.

OECD (2019): An Introduction to Online Platforms and Their Role in the Digital Transformation, Paris: OECD Publishing.

Parthasarathi, Vibodh/Agarwal, Simran (2023): "Platformisation of Matchmaking: Reconfiguring Social Economies in India." In: Philippe Bouquillion/Cécile Ithurbide/Tristan Mattelart (eds.), Digital Platforms and the Global South: Reconfiguring Power Relations in the Cultural Industries, London: Routledge, pp. 56-73.

Plantin, Jean-Christophem/Lagoze, Carl/Edwards, Paul N./Sandvig, Christian (2018): "Infrastructure Studies Meet Platform Studies in the Age of Google

and Facebook." In: New Media & Society 20/1, pp. 293-310. https://doi.org/10.1177/1461444816661553.

Sen, Amartya (1999): Development as Freedom, Oxford: Oxford University.

Srinivasan, Janaki (2020): The Political Lives of Information, Cambridge: MIT Press.

Srnicek, Nick (2017): Platform Capitalism, Cambridge: Polity.

United Nations Economic and Social Commission for Asia and the Pacific (2020): Digital Transformation for Sustainable Development in Asia and the Pacific. United Nations. https://www.unescap.org/publications/digital-transformation-sustainable-development-asia-and-pacific

Van Dijck, José/Poell, Thomas/De Waal, Martijn (2018): The Platform Society: Public Values in a Connective World, Oxford: Oxford University.

Verma, Anuja (2021): "Phishing in the Ocean of Deceit: Review of the Series Jamtara: Sabka Number Ayega." In: Media Asia 48/4, pp. 384-386. https://doi.org/10.1080/01296612.2021.1971915.

World Benchmarking Alliance (2020): Digital Inclusion Benchmark: Measuring the World's Leading Technology Companies. https://www.worldbenchmarkingalliance.org/publication/digital-inclusion-benchmark/