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Beyond Digital Inclusion: Institutional Confidence, Women's Inclusion and the Governance Pathways of Sustainable Development in India

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Abstract

Digital Public Infrastructure (DPI) has become a cornerstone of governance reform and development strategy across the Global South. Most existing scholarship examines what these digital systems do how they improve service delivery, cut administrative costs, and expand financial access. Far less attention has gone to the question of how they produce broader social outcomes. This paper takes up that question by examining the relationship between Digital Public Infrastructure, institutional confidence, and women's inclusion in India.

The study draws on three theoretical traditions: the Capability Approach (Sen, 1999; Nussbaum, 2011), Empowerment Theory (Kabeer, 1999), and institutional governance scholarship (Evans, 1995; Fukuyama, 2013). From these, it develops the Governance Pathways Framework, which explains how DPI shapes inclusion through a chain of governance mechanisms rather than through technological adoption alone. Using qualitative case study methods and documentary analysis (Bowen, 2009; Yin, 2018), the research focuses on India's interlocking digital ecosystem Aadhaar, the Unified Payments Interface (UPI), Digi Locker, Direct Benefit Transfer (DBT), and the Pradhan Mantri Jan Dhan Yojana (PMJDY).

The central finding is that Digital Public Infrastructure matters as governance infrastructure, not just as technology. When digital systems make institutions more accessible and reliable, they build citizens' confidence in those institutions and it is that confidence which drives broader participation in formal economic, welfare, and administrative life. The paper argues that this governance dimension is where the real developmental significance of DPI lies. In connecting digital governance research with debates on gender, inclusion, and the Sustainable Development Goals (particularly SDGs 5 and 16), it fills a gap left by existing technology-focused accounts.

Keywords: Digital Public Infrastructure, Institutional Confidence, Women's Inclusion, Digital Governance, Sustainable Development Goals India, Governance Pathways Framework.

1. Introduction

Over the past decade, digital technology has shifted from a supporting role in public administration to a structuring force within state governance itself. Governments now rely on digital systems to deliver welfare benefits, manage identity records, process financial transactions, and provide a widening range of public services. Out of this transformation has emerged the concept of Digital Public Infrastructure: shared

digital platforms that provide foundational capabilities digital identity, payment systems, and data exchange across entire economies (G20 Digital Economy Working Group 2023; OECD 2020;World Bank, 2021). As policymakers search for scalable pathways to inclusive growth, DPI has claimed a prominent place in the development conversation. The interest is not arbitrary. Traditional development strategies leaned heavily on physical infrastructure, public expenditure, and institutional reform. These remain important, but digital technologies have come to be seen as a complementary mechanism capable of cutting transaction costs, reaching excluded populations, and improving service consistency. International organisations have accordingly framed DPI as a key enabler of financial inclusion, institutional modernisation, and sustainable development (United Nations 2015; World Bank, 2021).

Yet the speed of this diffusion has outpaced analytical understanding. Much of the discussion about Digital Public Infrastructure concentrates on performance transaction volumes, adoption rates, efficiency metrics. Academic work has similarly focused on measurable service delivery improvements and financial inclusion outcomes (Demirgüç-Kunt et al., 2022; Muralidharan et al., 2016). These contributions matter, but they leave a more fundamental question largely unanswered: through what mechanisms do digital systems actually generate broader social inclusion?

That question matters especially when gender is brought into view. Across the Global South, digital tools are frequently promoted as instruments of women's empowerment. The optimism is understandable, but decades of gender and development research urge caution. As Kabeer (1999) has argued, empowerment is not the same as access; it requires the capacity to exercise meaningful choice. Sen's (1999) capability framework makes a similar point substantive freedom, not the mere availability of resources, is what enables people to live differently. Seen through this lens, the presence of digital infrastructure tells us relatively little about whether women can genuinely participate in economic and institutional life.

India offers a particularly rich setting in which to explore these questions. Over the past decade, the country has assembled one of the most extensive Digital Public Infrastructure ecosystems in the world. Aadhaar is the largest biometric identity system globally, UPI has transformed the scale and pace of digital transactions and these platforms interact with Digi Locker, DBT, and PMJDY to form an integrated architecture that increasingly mediates everyday interactions between citizens and the state. India has become a standard reference point in international discussions of digital transformation (NITI Aayog, 2022; World Bank, 2025).

What makes this experience analytically interesting is not merely the scale of technological adoption. It is the possibility that digital systems have begun to reshape how citizens experience public institutions. Applying for welfare benefits, verifying identity, receiving government transfers, and accessing official documentation now flow through interconnected digital channels. This raises a proposition worth taking seriously: the developmental significance of Digital Public Infrastructure may lie not in the technology itself but in its capacity to alter the relationship between citizens and institutions.

This paper explores that proposition. It argues that Digital Public Infrastructure should be understood as governance infrastructure a set of systems that reshape institutional relationships rather than simply digitising existing ones. The core claim is that digital systems produce developmental outcomes because they change how citizens experience institutions. When services become more accessible and processes more predictable, citizens develop greater confidence in governance. That confidence, in turn, shapes participation in financial, welfare, and administrative systems and it is through that chain that broader inclusion becomes possible.

To capture this dynamic, the paper develops the Governance Pathways Framework. Drawing on the Capability Approach, Empowerment Theory, institutional governance scholarship, and digital governance literature, the framework maps how DPI contributes to inclusion through sequential governance mechanisms: improved institutional accessibility, enhanced reliability, and strengthened institutional confidence. The paper makes three specific contributions. First, it shifts the analytical focus from technological adoption to governance processes. Second, it identifies institutional confidence as a critical but underexplored mechanism in the DPI-inclusion relationship. Third, it brings these arguments to bear on gender and development, showing how institutional dynamics shape whether digital systems actually expand women's opportunities.

The paper proceeds as follows. The next section reviews existing literature and identifies the research gaps. The Governance Pathways Framework is then introduced and its theoretical foundations explained. The methodology is set out before the findings are presented and discussed. The paper concludes by drawing out policy implications and reflecting on broader significance for inclusive development.

2. Literature Review and Research Gap

The rise of Digital Public Infrastructure reflects broader shifts in how scholars and policymakers think about governance, state capacity, and development. Over two decades, digital technologies have moved from the margins of public administration to the centre of policy debates on institutional effectiveness and social inclusion. Despite growing attention, important questions about the mechanisms linking digital systems to developmental outcomes remain poorly understood.

2.1 Digital Governance and the Emergence of Digital Public Infrastructure

Early research on digital governance was largely preoccupied with administrative efficiency how information and communication technologies could reduce bureaucratic costs and improve public service delivery (Heeks, 2002). Over time, scholars began examining the broader institutional implications of digitisation. Dunleavy et al. (2006) argued that digital technologies were not merely tools of existing governance structures but were reshaping those structures fundamentally. Janowski (2015) traced an evolution from administrative modernisation toward more complex transformations of state-society relationships.

Within this broader context, Digital Public Infrastructure has emerged as a distinct policy paradigm. Unlike earlier e-government initiatives, which addressed individual services in isolation, DPI refers to foundational digital systems that enable a wide range of interactions among citizens, governments, and markets covering digital identity, interoperable payments, and data-sharing architectures (G20 Digital Economy Working Group, 2023; OECD, 2020). The World Bank (2021) and OECD (2020) have both highlighted DPI as a critical enabler of inclusive development, reinforcing a growing policy consensus that digital infrastructures can strengthen developmental outcomes.

Yet the literature remains disproportionately focused on technological adoption and operational performance. Research typically evaluates digital initiatives through transaction volumes, efficiency gains, or user uptake figures (Demirgüç-Kunt et al., 2022; World Bank, 2016). These are useful indicators, but they offer limited insight into how digital infrastructures alter the relationship between citizens and institutions. The governance mechanisms through which DPI contributes to development therefore remain insufficiently theorised.

2.2 Institutions, Governance, and Citizens' Confidence

Institutional quality has long occupied a central position in development scholarship. North (1990) defined

institutions as the formal and informal rules that structure human interaction and argued that the quality of these rules shapes economic and social trajectories. Subsequent scholars extended this argument: Evans (transformation, while Fukuyama (2013) linked effective governance to patterns of institutional confidence.

A recurring insight in this tradition is that development depends not only on institutions existing but on citizens trusting them. Institutions perform effectively when they are perceived as reliable, accessible, and responsive. Rothstein (2011) has shown that institutional quality correlates with broader patterns of social participation, and Fukuyama (2013) has emphasised how perceptions of governance shape public engagement with state systems.

Strikingly, these insights have rarely been carried into discussions of DPI. Most of that literature implicitly assumes that improved service delivery automatically produces better governance outcomes. Yet citizens do not interact with technologies in the abstract—they interact with institutions through technological channels. Whether digital systems contribute to inclusion may therefore depend critically on how they shape citizens' perceptions of those institutions. This is the missing link that the present paper seeks to supply.

2.3 Women's Inclusion: Beyond Access

Questions of inclusion and particularly gender inclusion have become central to contemporary development debates. Sustainable Development Goal 5 identifies gender equality and women's empowerment as foundational to sustainable development, and digital technologies are frequently presented as tools through which those objectives can be pursued (United Nations, 2015). Yet the relationship between technology and inclusion is more complicated than promotional discourse tends to suggest.

The Capability Approach offers a useful lens for working through this complexity. Sen (1999) argues that development is best understood as the expansion of substantive freedoms not the accumulation of resources but the ability to live a life one has reason to value. Nussbaum (2011) extends this argument by specifying the capabilities that meaningful participation in society requires. Both perspectives caution against equating access to technology with empowerment.

Kabeer's (1999) Empowerment Theory adds a further dimension. Empowerment, she argues, involves an interaction of resources, agency, and achievements. Access to opportunities is necessary but insufficient; what matters is whether individuals can exercise meaningful choice. Women may have access to digital services while facing social, institutional, or economic constraints that continue to restrict participation. This suggests that the institutional environment within which technologies operate is as important as the technologies themselves.

Recent evidence confirms both the promise and the limitations of digital inclusion. Digital financial services have expanded economic participation; digital identity systems have improved access to public services (Demirgüç-Kunt et al., 2022). At the same time, persistent gaps in digital literacy, device ownership, affordability, and prevailing social norms continue to constrain women's engagement with digital ecosystems (GSMA, 2024; UN Women, 2024). Technology alone, in other words, cannot guarantee inclusion.

2.4 The Indian Case and the Missing Link

India has become one of the most widely referenced examples of DPI led development. Aadhaar, UPI, DigiLocker, PMJDY, and DBT collectively form a digital ecosystem that has substantially transformed how citizens interact with public institutions (Muralidharan et al., 2016; NITI Aayog, 2022). International

organisations frequently point to India's experience as evidence of what digital infrastructure can achieve at scale (World Bank, 2025).

Yet existing analyses of India's digital transformation concentrate on financial inclusion, service efficiency, and administrative performance. These are genuine and important outcomes. What receives far less attention is the institutional logic that connects digital systems to broader developmental effects. The missing link, this paper argues, is institutional confidence. Digital systems that reduce barriers, improve predictability, and increase reliability may strengthen citizens' confidence in institutions. That confidence, in turn, may encourage greater participation in formal economic, welfare, and administrative systems especially among populations historically excluded from those systems.

2.5 Research Gaps

Three gaps in the existing literature emerge from this review. First, scholarship on Digital Public Infrastructure remains heavily oriented toward technological performance and operational outcomes, with limited attention to governance mechanisms (Demirgüç-Kunt et al., 2022; World Bank, 2016). Second, although institutional confidence is well established within governance theory, it has rarely been applied to analyses of DPI (Fukuyama, 2013; Rothstein, 2011). Third, studies of women's inclusion tend to emphasise access to digital tools rather than the institutional relationships that determine whether access translates into participation (GSMA, 2024; Kabeer, 1999; UN Women, 2024). This paper addresses all three gaps through the Governance Pathways Framework developed in the next section.

3. The Governance Pathways Framework

The argument advanced in this paper begins with a simple observation: transaction volumes and adoption statistics tell us what digital systems are doing but not how they are generating the outcomes we care about. Developmental significance requires a different kind of explanation one that traces the processes through which digital infrastructures reshape relationships between citizens and institutions.

The Governance Pathways Framework is built to provide that explanation. It proposes that Digital Public Infrastructure contributes to women's inclusion not directly but through a sequence of governance mechanisms: improved institutional accessibility, enhanced institutional reliability, and strengthened institutional confidence. These three mechanisms, taken together, create the conditions under which participation in economic, administrative, and welfare systems becomes more feasible and in which inclusion, in a substantive rather than merely formal sense, becomes possible.

The framework draws on four bodies of scholarship, each contributing a distinct analytical layer.

The Capability Approach, developed by Sen (1999) and extended by Nussbaum (2011), offers the first layer. Rather than measuring development in terms of resources or economic output, this approach directs attention to the expansion of substantive freedoms the real opportunities available to people to live lives they value. Applied to Digital Public Infrastructure, this means asking not whether people have access to digital tools but whether those tools expand meaningful opportunities for participation. A digital identity or mobile payment account is developmentally relevant only when it enables people to engage more effectively with institutions and public services.

The second layer comes from Kabeer's (1999) Empowerment Theory. Kabeer conceptualises empowerment as an interplay of resources, agency, and achievements. Resources open doors; agency allows individuals to walk through them; achievements are what follow when both are present. The implication for DPI is clear: access to digital systems can increase the availability of resources, but empowerment does not follow automatically. It depends on the institutional environment within which

technology operates which is precisely why governance processes are analytically central to understanding digital inclusion.

Institutional governance scholarship provides the third pillar. North's (1990) foundational argument that institutions shape social and economic behaviour by reducing uncertainty remains as relevant as ever. Evans (1995) and Fukuyama (2013) extended this tradition by showing how state capacity and institutional quality shape development trajectories. What this body of work makes clear is that citizens' perceptions of institutions matter enormously. People are more likely to participate in public programmes, financial systems, and governance processes when they believe those institutions will work fairly and consistently (Rothstein, 2011). Institutional confidence is therefore not merely an attitudinal variable it is a mechanism that shapes behaviour and participation.

The fourth pillar is digital governance scholarship. Early studies treated digital technologies primarily as instruments of administrative modernisation (Heeks, 2002). Later research showed that digital systems can transform governance structures by altering how states interact with citizens (Dunleavy et al., 2006; Janowski, 2015). This paper pushes that insight further by conceptualising Digital Public Infrastructure as governance infrastructure analogous, in its organising function, to roads, financial systems, or electricity networks. Its significance lies not in digitisation per se but in its capacity to restructure the foundations through which interactions among citizens, governments, and markets occur.

Drawing these strands together, the framework proposes the following causal sequence:

Digital Public Infrastructure → Institutional Accessibility → Institutional Reliability → Institutional Confidence → Women's Inclusion → Sustainable Development Outcomes

The first pathway concerns accessibility. Digital Public Infrastructure reduces barriers to institutional engagement simplifying administrative procedures, expanding service availability, and making it possible to complete transactions without physical presence or reliance on intermediaries. Greater accessibility means more citizens can engage with public institutions, expanding the pool of those for whom participation is even possible.

The second pathway concerns reliability. Repeated interaction with digital systems tends to standardise and regularise the experience of governance. Citizens encounter fewer uncertainties; processes become more predictable; outcomes are less subject to discretionary intervention. This shift from inconsistency to predictability is what gives digital systems their governance significance, not merely their operational efficiency.

The third pathway concerns confidence. Reliable institutional experiences, accumulated over time, shape how citizens perceive the institutions they are dealing with. When systems work consistently, when benefits arrive on time, when verification is routine rather than arbitrary these experiences generate perceptions of institutional effectiveness and responsiveness. Confidence, in Fukuyama's (2013) and Rothstein's (2011) terms, is the outcome. But it is also a mechanism: it encourages citizens to engage with formal systems rather than avoiding them or seeking informal alternatives.

The fourth pathway links confidence to inclusion. People who perceive institutions as accessible and reliable are more likely to participate in financial services, claim welfare entitlements, and engage with administrative processes. For women specifically, this can expand economic opportunities, strengthen agency, and create pathways into institutional systems from which they have historically been excluded consistent with what both the Capability Approach and Empowerment Theory would predict.

The framework ultimately insists that the relationship between DPI and development is mediated by governance mechanisms rather than determined by technology. This is not a minor qualification. It

challenges the technologically deterministic logic that pervades much policy discussion of digital transformation and redirects analytical attention toward the institutional processes through which digital systems generate social outcomes. Institutional confidence, in particular, has been largely absent from existing accounts of DPI. Naming it and placing it within a causal sequence is the central theoretical contribution this paper makes.

4. Methodology

This study uses a qualitative case study design to investigate how Digital Public Infrastructure contributes to women's inclusion through institutional processes. The objective is not statistical inference but an examination of the governance dynamics particularly institutional accessibility, reliability, and confidence that existing quantitative studies leave largely unexplored. A qualitative approach is suited to this purpose precisely because it enables the analysis of processes, relationships, and contextual meanings that resist capture through numerical indicators alone (Denzin, 1978; Yin, 2018).

India was chosen as the case setting for reasons that are both substantive and methodological. Substantively, India has developed one of the most extensive and institutionally integrated Digital Public Infrastructure ecosystems in the world. Aadhaar, UPI, Digi Locker, DBT, and PMJDY do not function as isolated applications; they form an interlocking architecture through which identity verification, financial transactions, documentation, and welfare delivery are increasingly coordinated. That integration is precisely what makes the Indian case analytically valuable for examining governance mechanisms (NITI Aayog, 2022; World Bank, 2025). Methodologically, India functions as a critical case one that, because of its scale and international prominence, offers the potential for generating insights with broader theoretical relevance (Yin, 2018).

The principal method is documentary analysis. Documentary sources constitute a well-established form of evidence in public policy and governance research, particularly where the aim is to understand policy frameworks, institutional arrangements, and implementation processes across time (Bowen, 2009). Four categories of material were examined. Government documents and policy reports from the Ministry of Electronics and Information Technology (MeitY), the Unique Identification Authority of India (UIDAI), and the National Payments Corporation of India (NPCI) provided primary institutional perspectives. Reports from international organisations the World Bank, OECD, UNDP, and UN Women supplied comparative and developmental context. Peer-reviewed scholarship on digital governance, institutional theory, and gender-inclusive development formed the theoretical backbone of the analysis. Secondary statistical sources on financial inclusion and digital adoption were used to contextualise and triangulate documentary evidence.

The analysis proceeded through a thematic approach. Documents were examined for recurring patterns relating to accessibility, reliability, institutional confidence, participation, and inclusion. These patterns were then interpreted through the Governance Pathways Framework, with particular attention to evidence of how digital systems altered citizens' experiences of public institutions and how those changes shaped opportunities for participation. The analytical process was guided throughout by the theoretical frameworks of the Capability Approach (Sen, 1999; Nussbaum, 2011), Empowerment Theory (Kabeer, 1999), institutional governance scholarship (Evans, 1995; Fukuyama, 2013; North, 1990), and digital governance literature (Dunleavy et al., 2006; Heeks, 2002; Janowski, 2015).

Several limitations deserve acknowledgement. The study relies on documentary evidence and secondary sources rather than primary fieldwork, which means it cannot capture individual citizens' lived experiences

of digital systems. The single-country focus limits generalisation in the conventional sense. These are genuine constraints, though they are consistent with the study's purpose: the goal is theory development generating a framework grounded in an analytically significant case rather than statistical representativeness. The following section presents the findings and assesses the Governance Pathways Framework against the evidence.

5. Findings and Discussion

The evidence from India's Digital Public Infrastructure ecosystem does not support a simple story of technology causing inclusion. What the analysis reveals is more nuanced, and more interesting: the relationship between DPI and women's inclusion runs through a set of governance changes that digital systems make possible. Aadhaar, UPI, DigiLocker, DBT, and PMJDY matter not primarily because they are digital but because they have altered how citizens interact with public institutions. That alteration, as the following subsections show, operates through three interconnected mechanisms accessibility, reliability, and institutional confidence.

5.1 Accessibility: Closing the Distance Between Citizens and Institutions

A persistent theme across the documentary evidence is the degree to which India's Digital Public Infrastructure has reduced barriers that historically kept large sections of the population at a distance from formal institutions. For women in particular, these barriers were not merely practical obstacles they were structural features of a governance environment in which documentation requirements, physical distance, dependence on intermediaries, and administrative opacity systematically disadvantaged those with weaker institutional footholds.

Digital identity has done the most visible work in addressing this problem. Aadhaar created a verifiable identity credential that could be linked across services and institutions, enabling people who had previously struggled to prove who they were to navigate formal systems more effectively (Abraham et al., 2018; Khera, 2017). Debates about exclusion and privacy in the Aadhaar system are real and should not be minimised. But alongside those concerns, the evidence points to a significant expansion in the conditions under which citizens can access identity dependent services.

This matters for reasons that go beyond administrative convenience. From the perspective of the Capability Approach, reducing procedural barriers expands what people can do it enlarges the effective set of opportunities available to them (Sen, 1999). Access to identity, financial services, and welfare programmes becomes developmentally meaningful when it creates new pathways for institutional engagement, not simply when it registers users in a database.

PMJDY reinforced this expansion in the financial domain. Bank account ownership has historically served as a gateway to formal economic life, and the programme brought previously excluded populations including large numbers of rural women into the formal banking system, creating the conditions for savings, direct benefit transfers, and engagement with other financial services (Demirgüç-Kunt et al., 2022; Reserve Bank of India, 2023). UPI extended the reach of formal finance further, reducing the friction involved in digital transactions and accelerating integration into the cashless economy (National Payments Corporation of India, 2024; World Bank, 2025). What these initiatives share is the capacity to shorten the distance between citizens and the institutional systems that shape their economic lives.

5.2 Reliability: From Access to Predictability

Access to institutions is necessary but not sufficient for inclusion. Citizens may be technically able to engage with public systems while remaining unwilling to do so if those systems are inconsistent, opaque,

or subject to arbitrary variation. The evidence therefore points to a second, and equally important, mechanism: the contribution of Digital Public Infrastructure to institutional reliability.

Reliability, in the institutional sense that North (1990) and Fukuyama (2013) use, refers to the degree to which interactions with public systems produce consistent and anticipated outcomes. The evidence from India suggests that DPI has contributed to this dimension by standardising administrative processes and reducing the space for discretionary behaviour.

Direct Benefit Transfer illustrates this clearly. Prior to the widespread rollout of digitally enabled welfare payments, the delivery of government transfers was mediated by layers of administrative process that introduced delay, inconsistency, and leakage. DBT's architecture connecting biometric identity, banking infrastructure, and payment systems created a more direct relationship between beneficiaries and the state, and in doing so made the experience of receiving welfare substantially more predictable (Muralidharan et al., 2016; World Bank, 2021). The governance significance of this change lies not in the efficiency gains, important as those are, but in the normalisation of reliable institutional performance as something citizens can actually depend on.

DigiLocker makes a similar point through a different route. Being able to access, store, and share authenticated documents digitally removes a source of administrative unpredictability that affected anyone who needed to produce official documentation repeatedly or across multiple institutional contexts. The change may seem technical, but its governance meaning is substantial: it brings documentation, and the institutional processes that depend on it, within routine reach.

Importantly, these reliability gains are not products of individual platforms working in isolation. They emerge from the interaction of Aadhaar, UPI, PMJDY, DBT, and DigiLocker as components of an integrated system. This finding supports the growing international framing of DPI as an ecosystem rather than a collection of standalone applications (G20 Digital Economy Working Group, 2023; OECD, 2020) and it has practical implications for how digital infrastructure is designed and evaluated.

5.3 Institutional Confidence: The Mechanism That Links the Others

The most significant finding of the study concerns what happens when accessibility and reliability accumulate over time. The evidence suggests that consistent, positive interactions with digital systems shape how citizens perceive the institutions delivering those systems and that these perceptions, in turn, influence whether citizens engage with formal systems at all. Institutional confidence, in other words, is not merely a pleasant by-product of good governance; it is a critical mechanism in the causal chain connecting digital transformation and inclusion.

Rothstein (2011) and Fukuyama (2013) both argue that citizens' willingness to participate in public systems is shaped significantly by their judgements about institutional reliability and responsiveness. When welfare benefits arrive on schedule, when financial transactions are completed without friction, when administrative procedures are navigable and consistent, people develop a sense that engaging with institutions is worthwhile. Over time, these accumulated impressions reduce the perceived risks of formal engagement and increase the likelihood of continued participation.

This insight reframes how we should think about Digital Public Infrastructure. The conventional policy focus is on adoption metrics how many people have registered for Aadhaar, how many transactions UPI has processed, how many accounts PMJDY has opened. These are meaningful measures, but they capture only the surface. What matters developmentally is whether repeated interactions with digital systems are producing confidence in the institutions those systems represent. Where they are, the effects can extend well beyond the immediate services in question, encouraging engagement with broader formal systems

and gradually normalising institutional participation for populations that have historically kept their distance.

This finding points to a gap in existing scholarship that deserves more attention. Policy debates around DPI rarely ask how digital systems influence citizens' perceptions of governance. The Governance Pathways Framework suggests that this omission may cause policymakers to overlook one of the most consequential channels through which digital infrastructure generates developmental effects.

5.4 Women's Inclusion and the Governance Pathways

Viewed through the combined lens of accessibility, reliability, and institutional confidence, the relationship between Digital Public Infrastructure and women's inclusion looks less like a technological story and more like a governance one. The evidence does not support the idea that digital tools automatically empower women; neither does it suggest that digital systems are irrelevant to empowerment. What it supports is the more specific claim that DPI contributes to women's inclusion by changing the institutional environment in which they operate.

This is precisely what the Capability Approach and Empowerment Theory would predict. Access to digital identity or payment systems expands the resource base it opens doors. But whether women walk through those doors depends on whether the institutional environment on the other side is one they can navigate effectively. When digital systems reduce administrative barriers, regularise service delivery, and build confidence in institutional processes, they create conditions under which women are better placed to convert access into genuine participation—and participation into the kind of agency that Kabeer (1999) and Nussbaum (2011) associate with meaningful empowerment.

At the same time, the evidence is clear that these conditions do not emerge automatically or uniformly. Gaps in digital literacy, device access, affordability, and the persistence of restrictive social norms continue to shape whether women benefit from digital systems (GSMA, 2024; UN Women, 2024). Digital Public Infrastructure can widen doors, but it cannot dismantle the structural forces that prevent some from approaching them. Inclusion, in this reading, is the product of an interaction between digital systems, institutional environments, and social conditions not a direct output of technological investment.

The Governance Pathways Framework holds. The evidence from India's DPI ecosystem supports the proposition that digital systems contribute to women's inclusion by strengthening governance relationships through the sequential mechanisms of accessibility, reliability, and institutional confidence. And it confirms the framework's central insistence that technology, in this story, is the medium rather than the message.

6. Policy Implications

The findings of this study carry practical consequences for how governments and development organisations think about and evaluate Digital Public Infrastructure. If the developmental significance of DPI lies primarily in governance mechanisms rather than in technological adoption, then the conventional metrics used to assess digital transformation are likely measuring the wrong things or at least missing the most important ones.

A first implication is that evaluation frameworks need to be redesigned to capture governance outcomes. Platform registrations, transaction volumes, and user adoption statistics remain useful as baseline indicators, but they say little about whether digital systems are making institutions more accessible, reliable, or trustworthy. Measures of citizens' experiences of institutional processes including accessibility, predictability, and confidence in outcomes could provide a more meaningful account of DPI's

developmental impact. A digital platform may achieve large-scale use without meaningfully improving citizens' encounters with governance. Conversely, a system that genuinely strengthens institutional confidence may generate substantial developmental benefits even where adoption remains uneven or incomplete.

Second, the findings reinforce the importance of thinking about Digital Public Infrastructure as an ecosystem rather than a portfolio of individual applications. The governance value of India's digital architecture the improvements in accessibility, reliability, and confidence that the evidence documents emerges from the integration of Aadhaar, UPI, PMJDY, DBT, and DigiLocker rather than from any one of them individually. Countries developing or scaling up DPI should therefore focus on interoperability and institutional coordination as much as on individual platform performance. Replicating a single application is unlikely to generate the governance effects that flow from an interconnected system.

Third, the study underscores the need for explicitly gender-responsive digital governance. The expansion of digital infrastructure creates opportunities for inclusion, but access to technology and inclusion in social and economic life are not the same thing. Persistent gaps in digital literacy, affordability, device access, and social norms continue to constrain what women can do with digital systems, even when those systems exist and nominally reach them (GSMA, 2024; UN Women, 2024). Policy investment in digital infrastructure should therefore be matched by investment in complementary capabilities: digital literacy programmes, community-based support mechanisms, and targeted outreach that recognises the social context within which digital engagement occurs. Infrastructure and capability development need to proceed together.

Fourth, institutional confidence should be treated as a policy objective in its own right, not merely as a by-product of good service delivery. The evidence suggests that citizens' perceptions of institutional reliability and responsiveness play a central role in determining whether digital systems encourage or discourage engagement with formal systems. Policymakers should recognise that investments in DPI are simultaneously investments in institutional legitimacy. Sustaining that legitimacy requires transparency, accountability, and responsiveness alongside technical performance.

This is particularly important in relation to privacy, data protection, and digital rights. As digital systems expand and handle increasing volumes of personal data, concerns about surveillance, exclusion, and misuse can undermine confidence in ways that technical improvements alone cannot repair (Couldry & Mejias, 2019). Robust regulatory frameworks, clear accountability mechanisms, and genuine grievance redress processes are not optional safeguards they are necessary conditions for the long-term sustainability of institutional confidence in digital governance.

Finally, the findings have relevance beyond India for international development policy. Governments across Africa, Asia, and Latin America are exploring DPI as a pathway to accelerated development and improved public service delivery. The Indian experience demonstrates what is achievable but also illustrates what technology alone cannot achieve. The developmental impact of Digital Public Infrastructure depends fundamentally on the institutional environment within which it operates. Development strategies focused on digital transformation must therefore attend as carefully to governance architecture to questions of institutional quality, coordination, and legitimacy as to the digital systems themselves. Failing to do so risks building impressive technological infrastructure that leaves the deeper conditions of inclusion unchanged.

7. Conclusion

Digital Public Infrastructure has become one of the defining ideas in contemporary development policy. Governments across the world are investing in digital identity systems, payment platforms, and data architectures, presenting them as tools for expanding inclusion, improving governance, and accelerating development. The enthusiasm is understandable. But the dominant policy conversation has remained too focused on technology on what digital systems are and what they can do and not focused enough on how they produce the outcomes that actually matter.

This paper set out to examine the relationship between Digital Public Infrastructure, institutional confidence, and women's inclusion in India. Working from the Capability Approach (Sen, 1999; Nussbaum, 2011), Empowerment Theory (Kabeer, 1999), institutional governance scholarship (Evans, 1995; Fukuyama, 2013; North, 1990), and digital governance literature (Dunleavy et al., 2006; Heeks, 2002; Janowski, 2015), it developed the Governance Pathways Framework as a theoretical tool for understanding how digital systems contribute to developmental outcomes through governance mechanisms.

The central finding is that Digital Public Infrastructure functions as governance infrastructure, not merely as technology. The Indian case shows that platforms like Aadhaar, UPI, DigiLocker, DBT, and PMJDY are consequential not simply because they digitise services but because they alter the conditions of institutional engagement. By reducing barriers to access, regularising service delivery, and generating more consistent institutional experiences, these systems build the confidence that encourages participation in formal economic, welfare, and administrative life. That governance dynamic rather than the technology underlying it is where the developmental significance of DPI is ultimately located.

The paper's most distinctive contribution is the identification of institutional confidence as a critical and underexplored intermediary mechanism. Much existing scholarship has documented efficiency gains, financial inclusion outcomes, and service delivery improvements. What it has not adequately explained is why digital transformation sometimes generates broader social effects beyond the immediate domains it touches. The answer proposed here is that digital systems change how citizens experience institutions and that changed experience, accumulated over time, shapes whether people are willing to engage with formal systems at all. Institutional confidence is the bridge between digital transformation and social inclusion.

The study also speaks to debates on gender and development. Consistent with the frameworks of Sen (1999), Nussbaum (2011), and Kabeer (1999), inclusion cannot be measured in access alone. Digital technologies expand opportunities, but whether those opportunities translate into agency and participation depends on the institutional environment in which they are embedded. Digital Public Infrastructure can reshape that environment in important ways but it cannot substitute for addressing the structural inequalities that continue to constrain women's engagement with digital systems. The persistence of gaps in literacy, affordability, and social norms is a reminder that technological infrastructure and social transformation do not automatically move together.

Several limitations should be noted. The study draws primarily on documentary evidence and concentrates on a single country. Future research could test the Governance Pathways Framework through comparative case studies, longitudinal methods, and mixed-method designs incorporating survey and interview data. Exploring how the framework's mechanisms operate across different institutional and development settings would strengthen both its theoretical foundations and its practical applicability.

The fundamental argument this paper makes is relevant beyond any one country or any one set of digital systems. Digital Public Infrastructure is worth investing in because it can make governance work better

for more people. But the measure of that improvement cannot be the sophistication of the technology or the scale of its adoption. It must be whether digital systems are genuinely making institutions more accessible, more reliable, and more trustworthy and whether that change is expanding the real opportunities available to those who have historically been excluded.

As the pace of digital investment continues to accelerate, the central challenge is not building more technology. It is building institutions that people are willing and able to use. The future developmental impact of Digital Public Infrastructure will be determined not by innovation alone, but by whether that innovation creates governance systems that are genuinely worthy of public confidence.

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