

Accelerating Meaningful Digital Connectivity for Women in India: What We Know So Far

Evidence Synthesis Report
June, 2026



Evidence Synthesis Report



Access



Measurement



Trust & Safety



Skilling



Use Cases



Acknowledgements

This report is the outcome of a deeply collaborative effort.

We are grateful to our partners, experts, and reviewers who contributed their time and critical insights throughout its development.

We thank the following partner organizations associated with the Gender Equality and Digital Connectivity (GE-DC) portfolio (2022–2025) of the Gates Foundation: Aapti Institute, Indian Institute for Human Settlements (IIHS), Indian Statistical Institute (ISI), Jagriti, Karya, Quicksand, Resham Sutra, and the Evidence for Digital Transformation (EDiT) Consortium led by the University of Cape Town (UCT). Their research, program documents, and reflections on implementation formed the foundation of this synthesis. We are especially grateful to the study leads and their teams for their close engagement with draft versions of the report. Their rigorous and constructive feedback sharpened the framing, strengthened the evidence base, and clarified key insights and recommendations. This report reflects a collective ecosystem effort, and it would not have been possible without their sustained engagement. Detailed information on each study and its authors is listed below.

We thank colleagues at the Gates Foundation, Arjun Venkatraman, and Caryl Feldacker, for their strategic guidance, thoughtful input, and continued support in refining these insights to inform future strategy.

We would like to acknowledge the contributions of former GxD hub team members: Subhra Sen and Rasika Gopalakrishnan, who supported data aggregation, analysis, and review cycles at various stages of the process. We would like to thank Ameya Dandekar for support with data analysis. Additionally, we also thank Sara Chamberlain for supporting the early analysis of portfolio insights and her engagement with this work.

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Select sections of the report benefited from the use of AI-assisted tools for language editing. All analyses, interpretations, and conclusions remain the responsibility of the authors.

Illustrations in this report were developed using AI-assisted tools and are intended as conceptual visuals.

Suggested citation: Singh, D., Taneja, M., Eappen, E., & Manoharan, S. (2026). Accelerating meaningful digital connectivity for women in India: What we know so far. LEAD at Krea University (IFMR).

Portfolio Studies and Resources Informing the Synthesis

 Organization	 Project/Investment Name and List of Resources Referred	 Authors/Project Team
Apti Institute	Unbundling Women’s Trust in Digital Platforms a. Final report - Digital Trust Final Report [2025] b. trust.aapti	Aditi Shah, Akshobhya Reddy, Antara Madavane, Astha Kapoor, Ava Mumtaz Haidar, Gautam Misra, Manvi Parashar, Suha Mohamed
Indian Institute for Human Settlements (IIHS)	Learning Study on Connecting Informally Working Women in Urban Areas a. Final Report: Learning Study on Connecting Informally Working Women in Urban Areas [July 2024] b. Centering Trust in Product Design	Aditi Surie, Antara Rai Chowdhury, Raghav Mehrotra, Sona Mewati, Achyutha Sharma, Sukrit Nagpal
Karya¹	Sanmati 1.0 a. Published Research Article: Akal Badi ya Bias: An Exploratory Study of Gender Bias in Hindi Language Technology https://dl.acm.org/doi/10.1145/3630106.3659017 [June 2024] b. Sanmati Overview - Presentation Deck [January 2025] c. Project Sanmati - Phase 1 Completion Report	Rishav Hada, Safiya Husain, Varun Gumma, Harshita Diddee, Aditya Yadavalli, Agrima Seth, Nidhi Kulkarni, Ujwal Gadiraju, Aditya Vashistha, Vivek Seshadri, Kalika Bali
Quicksand	Gender Intentionality in Digital Skilling Playbook for Gender Intentionality in Digital Skilling	Ayush Chauhan, Jigeesha Nayyar, Sonata Dev, Anish Uddaraju, Ayushi Biyani, Libin Rahman, Ritha Krishnamurthy, Rushali Rohira, Sara Chamberlain and Nidhi Sen
GxD hub and Government of Meghalaya	Connecting the Dots: How Socio-Economic Contexts Shape Digital Inclusion in Meghalaya Report: Connecting the Dots: How Socio-economic Contexts Shape Digital Inclusion in Meghalaya (publication forthcoming) [October 2025]	Sharon Buteau, Ameya Dandekar, Yashita Jhurani, Subhra Sen, Nelson Mathews, Christopher Glan, Vatsima Tripathi, Rasika Gopalkrishnan, Diksha Singh

¹The synthesis report captures findings from only Phase 1 of the project, which was undertaken till December 2024.

<p>University of Cape Town; EDiT Consortium</p>	<p>Improving measurement of digital access and use among SHGs in Bihar: Preliminary findings</p> <p>a. <u>Digital skills amongst men and women in Bihar: Summary Findings</u> - Presentation Deck and brief</p> <p>Measurement Resources and Toolkits</p> <p>b. <u>Digital Access and Use Index (DAUI)</u></p> <p>c. Three Measurement toolkits: Published Reports</p> <p>1. <u>Measuring Digital Access in Low and Middle Income Countries [November 2024]</u></p> <p>2. <u>Measuring Digital Harms in Low and Middle Income Countries</u></p> <p>3. <u>Measuring Digital Skills in Low and Middle Income Countries [November 2024]</u></p>	<p>Amnesty LeFevre (UCT), Kerry Scott (York University), Diwakar Mohan (JHU), Mayank Date (JHU), Osama Ummer (UCT), Arpita Chakraborty (OPM), Nayan Kumar (OPM), Vasudha Chakravarthy (DevSol), Priyadarshini, Arjun Khanna (UCT), and Anjora Sarangi (UCT), Sara Chamberlain (2xDigital)</p>
<p>DP-WEE Program – LEAD at Krea & CECFEE at ISI</p>	<p>Improving women’s work opportunities: The role of skills in a digital world</p> <p>a. Smart Skilling: Experimental Evidence on Vocational Training Design - Published [November 2025]</p>	<p>Farzana Afridi, Tanu Gupta, Rachel Heath, Kanika Mahajan, Gautam Raj</p>
<p>Jagriti</p>	<p>Digital Literacy & Entrepreneurship Program Learning</p> <p>a. Tech Shakti Endline Assessment - Executive Summary: Presentation Deck [April 2025]</p> <p>b. Investment Document - Expenditure Responsibility Grant: Report</p>	<p>Dr. Vanita Viswanath, Ashutosh Kumar, Shilpi Singh, Dr. Khushboo Sharma Gaur, Anusuya Das</p>
<p>Resham Sutra</p>	<p>Women Weavers – Understanding Livelihoods & Digital Skill Adoption</p> <p>a. Women Weavers - Understanding Livelihoods and Digital Skill Adoption: Interim Report</p> <p>b. Women Weavers - Understanding Livelihoods and Digital Skill Adoption: Digitalization for producers in Silk Value Chain - Phase II [Dec 2024 - April 2025]</p> <p>c. Weaving Insights: Overview of Resham Sutra’s DISF Interim Report - Presentation Deck [July 2024]</p>	<p>Kunal Vaid, Upasna Jain</p>



Abbreviations

ABDM	Ayushman Bharat Digital Mission
ABHA	Ayushman Bharat Health Account
AI	Artificial Intelligence
ANM	Auxiliary Nurse Midwife
API	Application Programming Interface
ASHA	Accredited Social Health Activist
CGAP	Consultative Group to Assist the Poor
CLF	Cluster Level Federation
CMS:T	Comprehensive Modular Survey – Telecom
DFS	Digital Financial Services
DCI	Digital Capability Index
DPI	Digital Public Infrastructure
GE-DC	Gender Equality and Digital Connectivity
GSMA	Global System for Mobile Communications Association
HCD	Human-Centered Design
ICT	Information and Communication Technology
IIHS	Indian Institute for Human Settlements
MPI	Multidimensional Poverty Index
NCRB	National Crime Records Bureau
NFHS	National Family Health Survey
NPCI	National Payments Corporation of India
NSS	National Sample Survey
NSSO	National Sample Survey Office
OTP	One-Time Password
PM-JAY	Pradhan Mantri Jan Arogya Yojana
RBI	Reserve Bank of India
SHG	Self-Help Group
ToC	Theory of Change
UCT	University of Cape Town
UI	User Interface
UPI	Unified Payments Interface
UX	User Experience
WEF	World Economic Forum
WWB	Women's World Banking

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Accelerating Meaningful Digital Connectivity for Women in India: Key Insights



Equitable, meaningful, and safe access to digital technologies and associated opportunities is increasingly becoming a core pillar of inclusive development. Equitable digital inclusion depends on an interconnected ecosystem of affordable and reliable connectivity, widespread access to mobile devices, robust Digital Public Infrastructure (DPI), relevant digital services, user skills and literacy. When these layers function together seamlessly, they can support women and marginalized groups to access essential services and benefits such as health services, participate in financial systems, pursue education, expand livelihoods, and build entrepreneurial pathways. India's digital trajectory illustrates both the potential and the constraints of this transformation. The past decade has seen a significant expansion in mobile phone access and the growth of foundational DPI systems, enabling large-scale access to identity, banking, and public services. Yet persistent gender gaps in digital access, use, and skills underscore that infrastructure expansion alone does not ensure inclusion. Women continue to face structural and social barriers to meaningful digital engagement, including limited control over networked devices, lower levels of digital literacy, safety

and privacy concerns, and restrictive norms that shape when and how digital tools can be used. Without sustained attention to equity and inclusive design, digital and AI-enabled systems risk reproducing or amplifying existing disparities.

This report synthesizes key learnings from investments supported under the Gates Foundation's Gender Equality and Digital Connectivity (GE-DC) portfolio between 2022 and 2025, including foundational research studies and pilot initiatives. The portfolio engaged diverse user groups, including informal women workers, frontline health workers, adolescents, artisans, and self-help group (SHG) members and leaders, to document everyday realities of digital engagement in low-resource contexts. Portfolio findings were situated alongside national survey data, global benchmarks, and additional literature to contextualize the insights and arrive at a broader understanding of the state of women's digital inclusion, where feasible. The synthesis is structured around five learning pillars: digital access and affordability; trust and safety; skilling; use cases; and measurement learnings.

Key Insights²

01

Unpacking Digital Access: Why Access Alone Falls Short



NFHS-5 and NSS-CSMT data show persistent gender gaps in phone ownership and internet use, while GSMA (2025) reports that women in India are significantly less likely than men to own smartphones and are more likely to rely on borrowed devices. Evidence from this portfolio provides further nuance by examining the quality and autonomy of digital access and use.



Across multiple studies in the GE-DC portfolio, we find that women's access to smartphones is frequently shared, conditional, and negotiated within households. Even where women are recorded as device owners, phones often function as shared household assets. Time available for use is compressed into limited windows and shaped by domestic responsibilities and norms governing appropriate digital behavior.



Affordability of devices and data further mediates access. Device acquisition and data recharges are often financed or authorized by other household members. Women who independently pay for both devices and data exhibit higher levels of engagement across messaging, social media, and transactional applications. Financial decision-making thus emerges as a stronger predictor of meaningful use than device ownership alone.



Analyzing socio-demographic patterns of access suggests that younger and more educated women demonstrate greater confidence and diversity of use cases. Further, household deprivation levels correlate with both lower ownership and lower quality of devices.



²The key takeaways presented in this summary are drawn from an evidence synthesis of multiple reports, resources and studies conducted by nine partner organizations under the GE-DC portfolio. These studies had a wide range of methods and sampling approaches. The takeaways are triangulated with secondary literature and trends from national surveys and global benchmark surveys. For ease of presentation, individual attributions are not cited within this summary section. Detailed discussions of each study, including methodological approaches and specific findings with appropriate credits, are provided in the main report.

02

Digital Trust and Safety: A Critical Dimension



Digital trust and safety shape the depth and sustainability of women's digital participation. Across the portfolio, concerns about scams, fraud, reputational harm, and surveillance emerge as constraints to exploring new platforms and functionalities. Negative digital experiences can result in withdrawal, particularly in contexts where women have limited financial buffers or face social sanctions.



A key contribution of the portfolio is to situate trust as a relational factor within households and communities. Women's engagement is influenced by approval or mediation from spouses, sons, SHG leaders, and frontline workers.



Shared-device arrangements heighten risks around privacy and financial credentials, further constraining independent use. Engagement with platform safety features remains limited, and lower proficiency in managing privacy settings, blocking unwanted contacts, or changing passwords reinforces cautious behavior and reliance on others for high-stakes digital tasks.



Studies in the portfolio highlight design offerings such as vernacular access, simplified interfaces, predictable functionality, and visible grievance redress mechanisms as potential pathways to build and strengthen women's trust in digital platforms.



03

Enhancing Digital Skills



Across contexts, women's digital participation is concentrated around basic communication functions, while gaps widen for intermediate and advanced tasks.



Basic skills, such as making calls, show narrower gender gaps. However, independent performance of tasks such as installing apps, searching the internet, and making digital payments remains substantially lower among women.



Barriers to skill progression include low literacy, English-language interface dominance, supervised device use, time poverty, and fear of making mistakes. Standardized skilling programs often assume uninterrupted access and homogeneous readiness levels, which do not reflect women's lived realities.



Evidence from intervention pilots indicates that digital skills yield stronger outcomes when integrated with vocational training and livelihood pathways. Bundled digital and communication skills training is associated with higher rates of self-employment and productive use. Skill acquisition appears more durable when linked to tangible economic benefits and delivered through trusted networks.



04

Identifying High-Potential Pathways and Use Cases



Promising pathways identified across the portfolio include digital payments, social media and messaging platforms for enterprise, online learning platforms for skill acquisition, and community-mediated digital services. However, onboarding alone does not translate into sustained or independent use.



The adoption of higher-order use cases is influenced by duration and quality of access, financial autonomy, skill levels, trust, and safe opportunities to experiment. Emerging evidence suggests correlations between younger age, higher education, longer private access, and greater diversity of use cases, though further research is required to clarify these dynamics.

05

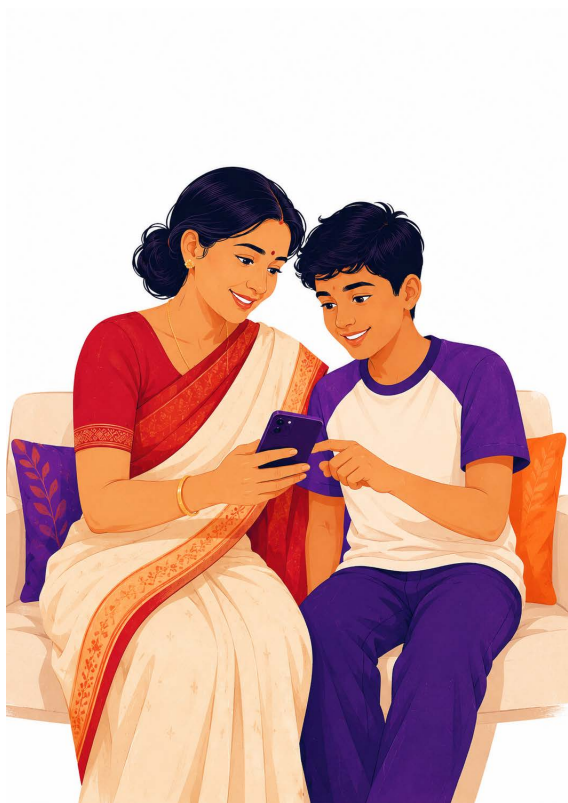
Measuring What Matters



Prevailing global and national surveys primarily rely on binary indicators of ownership and recent internet use. These measures overlook the complete range of factors that underpin digital access (connectivity, physical access, affordability) and use (digital competency, safety and security, social and gender norms, attitudes, digital agency, and relevance/use for high-impact use cases) among women.



The research and measurement investments in the GE-DC portfolio advance multidimensional measurement approaches, including the development of a digital access and use (DAU) index, which can be measured through the inclusion of a limited (<15) set of questions integrated into future surveys. Further indices specific to digital competency, including digital skills, have sought to establish a standard for assessment within mobile-first populations. Additional work to conceptualize and measure harms, as well as social and gender norms, has led to robust guidance on measurement, which can be utilized in future investments and large national and global surveys, including NFHS/DHS and MICS.



Emerging Directions for Program Design and Measurement



Shared, negotiated, and time-bound device access:

In the South Asian context, programs need to be designed to reflect women's shared, negotiated, and time-bound access to digital devices. Solutions must account for intermittent connectivity, limited storage capacity, and supervised use environments. Low-data, lite, vernacular, and voice-based functionalities are particularly relevant in low-resource contexts.



Financial agency over devices and data:

Strengthening women's financial agency over devices and data is critical. Skilling initiatives should integrate digital competencies within vocational and livelihood pathways and provide safe environments for experimentation.



Trust, privacy safeguards, and grievance mechanisms:

Trust and safety considerations should be embedded within design features, including privacy safeguards and grievance mechanisms. Community intermediaries should be recognized and supported as key facilitators of digital engagement rather than replaced.



Contextualized metrics for national and global surveys:

Validated and contextualized metrics developed under this portfolio require wider dissemination and integration into national and global surveys to enhance comparability and policy relevance. Programs should assess baseline conditions of access quality, skill levels, mediation patterns, and trust to inform tailored interventions and track progress.



Readiness for AI-enabled systems:

Disaggregated data by geography, socio-economic status, and life stage is necessary to capture intersectional inequalities. As AI becomes embedded within DPI systems, additional indicators will be required to assess women's readiness to navigate consent processes, interpret AI outputs, and engage safely with emerging technologies.

Women's digital inclusion is a multidimensional process extending beyond connectivity. This evidence synthesis underscores the need to approach women's digital inclusion efforts as a multidimensional process extending beyond connectivity.

As India advances toward deeper convergence between DPI and AI, ensuring that women can engage safely, confidently, and independently becomes central to equitable digital transformation.

In this context, future investments and knowledge-generation efforts can build on the evidence generated through this portfolio to align design, measurement, and implementation with women's lived realities and strengthen pathways from access to meaningful participation. While the evidence is primarily from the Indian context, it offers emerging actionable insights for philanthropies, policymakers, practitioners, and ecosystem actors on designing and scaling digital and AI platforms that are inclusive, gender-intentional, and responsive to women's patterns of digital access and usage in the larger South Asian context.

Context

01

Digital technologies are now central to how socio-economic development is imagined, delivered, and governed. However, equitable digital inclusion depends on multiple interconnected layers, including robust Digital Public Infrastructure (DPI), alongside affordable and reliable connectivity, access to mobile devices, relevant and accessible digital services, and user skills and literacy. Together, these layers can enable people, especially women and marginalized groups, to meaningfully participate in digital systems and translate access into improved socio-economic outcomes, including access to health services, financial systems, education and learning opportunities, and avenues for livelihood and entrepreneurship.

India's experience illustrates both the promise and limits of this digital transformation. Over the past decade, the foundational DPI stack has expanded access to biometric identity systems, real-time digital payments and bank accounts, and public services.

The Aadhaar system has streamlined identity verification for government welfare and health insurance schemes, enabling millions of low-income households to access essential services. Under the Jan Dhan Yojana, over 500 million no-frills bank accounts have been created, facilitating direct benefit transfers and contributing to women's financial autonomy (Press Information Bureau, 2024a).

This has positioned India as a global leader in shaping the DPI agenda, attracting international interest and setting benchmarks for other nations (Press Information Bureau, 2025b). At the same time, persistent gender gaps in digital access, use, and skills suggest that infrastructure alone does not guarantee inclusion (see Figure 1). Women continue to encounter significant barriers to meaningful digital engagement and use, including limited access to networked devices, low digital literacy, safety and privacy concerns, and restrictive social norms.



Figure 1: Snapshot of Gender-Disaggregated Data

Why GE-DC Synthesis Matters: Existing Evidence

Digital ecosystem opportunities

- The expansion of mobile connectivity, digital platforms, and public systems has created opportunities for finance, health, education, and livelihoods.
- India's digital scale is significant: 821 million active internet users in 2023, 1.12 billion mobile connections (TRAI 2024).

Yet headline progress masks persistent gender gaps:

Device Ownership & Access



Women are **38% less likely to own** a smartphone than men; only **36%** of women are smartphone users vs **58%** of men, while **77%** rely on shared devices (GSMA 2025, Kantar 2023).

Affordability



In India, **8% of women** (who are aware of internet but don't use it) report handset cost as the main barrier to mobile internet adoption, and 9% of women report data cost as the most important barrier (GSMA 2025).

Internet use



Mobile internet usage stood at **58% for men and 39% for women**, creating a gender gap of 33% (GSMA 2025).

Skills & literacy



Women's proficiency lags in key tasks; nationally, **men are 13.7 pp** more likely to perform UPI transactions (CMS-T, 2025).

Trust & safety



In India, about **26% of women** (who are aware of internet but don't use it) report safety and security as a top barrier to mobile internet adoption (GSMA 2025).

Norms & agency



Women's digital participation is shaped by social scrutiny as much as technology. Restrictive gender norms make women's phone use is mediated by concerns about reputation, safety, and propriety (Barboni et al., 2018).

Implication: Connectivity cannot be equated with meaningful inclusion. Women's digital realities are mediated by affordability, autonomy, trust, confidence, skills and social norms that shape when, how and for what purposes they engage.

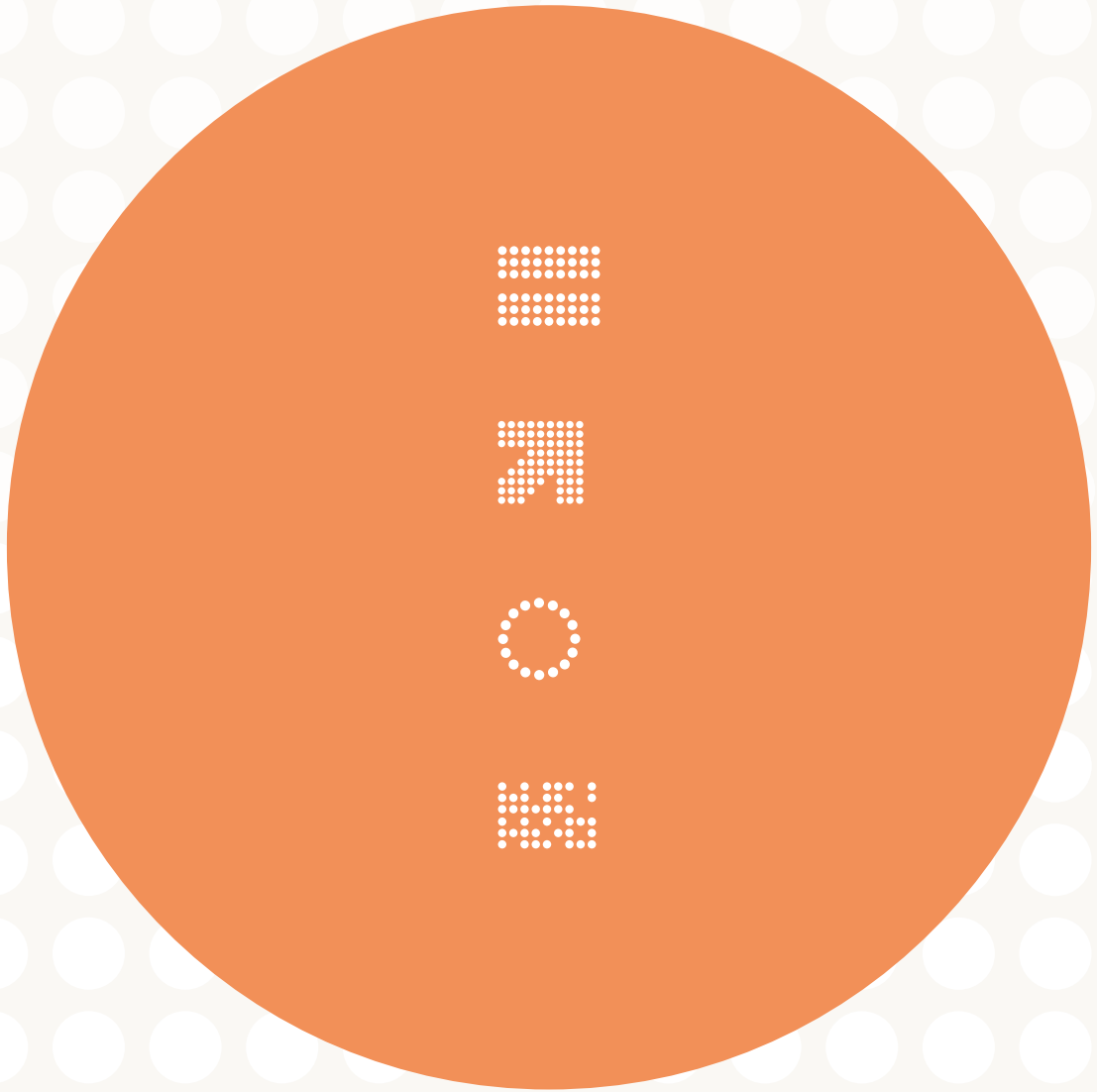
As India steps into the next phase of its digital journey with the rapid integration of Artificial Intelligence (AI) into governance and welfare delivery, it is important to account for and address this underlying gender digital divide.

The convergence of DPI and AI-enabled technologies can improve service delivery, policy targeting, and system efficiency across sectors such as health, agriculture, skilling, and finance, among others. Investments in large-scale computing infrastructure, indigenous language- and context-specific models, and ethics- and skills-focused initiatives mark a pivotal policy shift emphasizing innovation (National Institute for Smart Government & EY, 2025). However, without deliberate attention to equity and inclusive design, digital and AI tools and solutions risk deepening existing inequalities (Women in the Digital Economy Fund et al., 2024).

In this context, this report synthesizes critical learnings from a set of investments supported by the Gates Foundation under the Gender Equality and Digital Connectivity (GE-DC) portfolio between 2022 and 2025.

These investments were designed to deepen understanding across six interrelated barriers that continue to shape the gender digital divide: affordability, meaningful access, digital literacy, safety and security, restrictive social norms, and gaps in measurement. Building on existing evidence, this review provides emerging, actionable insights for philanthropies, policymakers, practitioners, and ecosystem actors on how to design digital and AI platforms and services that are inclusive and gender-intentional and account for women's fractured digital access.

In doing so, it seeks to inform the next wave of investments, policies, and programs at a moment when digital public infrastructure and AI are becoming increasingly embedded in development programs and service delivery.



Objectives, Scope, and Approach

02



Objectives

Drawing on the GE-DC learning agenda, the report is organized around the following learning pillars:



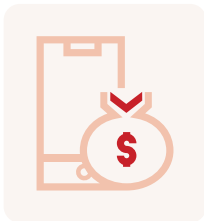
1. Unpacking Digital Access

How can meaningful digital access be understood beyond device ownership and connectivity to account for shared and mediated access, affordability, autonomy, quality of access, and the social conditions under which women engage with digital technologies?



2. Digital Trust & Safety

How are women's trust, safety, and willingness to engage with digital systems shaped by household dynamics, social norms, mediated relationships, and platform design? What factors and approaches can support safer, trusted, and more inclusive digital participation?



3. Skilling

What factors influence women's progression from basic access to confident, independent, and higher-order digital use? How can skilling approaches respond to differences in literacy, age, socio-economic context, access conditions, and lived realities?



4. Use Cases

Which digital and AI-enabled use cases hold the greatest potential to strengthen women's economic participation, service access, and agency? What conditions or factors enable meaningful adoption and sustained use?



5. Measurement and Metrics

What metrics and methodologies can best capture meaningful digital connectivity (spanning access, skills, use, and trust) across different contexts and segments, ensuring comparability and gender intentionality?

Scope

The review draws on foundational research studies, state-level representative surveys, exploratory and landscaping studies, intervention pilots, and program learning from 2022-2025.

This synthesis draws on GE-DC portfolio evidence from 2022-2025 to understand how women experience digital access, trust, safety, skills, and use in low-resource contexts, and what these insights suggest for gender-intentional digital inclusion.

This review includes findings from a diverse set of foundational research studies and pilot initiatives undertaken between 2022 and 2025 under the Gender Equality and Digital Connectivity (GE-DC) portfolio, triangulated with relevant literature and national data sources for the same period.

The portfolio studies and projects include state-level representative surveys, exploratory and landscaping studies, and intervention pilots and cover the following themes: measurement of women's digital access and use, moving beyond device ownership to capture depth of engagement and confidence; barriers to internet adoption, including design limitations, trust deficits and safety concerns that influence women's ability and willingness to engage with digital platforms; and embedding gender intentionality in on-ground programs. Two pilot projects tested models for women's participation in digital livelihoods, such as operating community-level digital infrastructure or contributing to data annotation and microwork. Studies engaged key user groups such as informal women workers, frontline health workers, adolescents, artisans, and members of self-help groups (SHGs) to better understand the everyday realities of digital engagement at the last mile. Complementary work examined how digital skilling programs can incorporate gender considerations and how institutions can design more inclusive digital systems.

Further details of the studies are provided in Annex 1.



Methodological Approach

Published reports and toolkits, as well as unpublished investment progress reports, event summaries, frameworks, ontological tools, presentations, and working papers/draft reports shared by the nine partners listed above, were analyzed for this synthesis effort³.

Findings from these studies were systematically organized and thematically coded across the five pillars - access (split into devices, connectivity, and affordability), digital skills, use cases, trust and safety (including the role of mediators and social norms), and measurement. Within measurement itself, insights are organized into three sub-themes - access, skills and use, and trust.

This framework ensured consistency in capturing and organizing learnings thematically, while accommodating methodological diversity across surveys, qualitative studies, and experimental pilots. The categorization and analysis of findings across these themes was cross-verified by multiple researchers in the team. Findings from the portfolio studies were triangulated with secondary literature and trends from national surveys (e.g., NFHS-5, CMS-T) and global benchmark surveys and datasets such as the GSMA Mobile Gender Gap reports, Oxford Digital Gender Dashboard, and WIDEF, organized along the same thematic buckets. This comparative lens ensures that insights are situated within wider national and global trends and capture divergences between localized evidence and systemic patterns.

Limitations

Given the variations in methodological approaches, indicator definitions, and sampling strategies across studies, data points were not always comparable.

Nonetheless, attempts have been made to extrapolate broader insights across the key pillars that can serve as guiding principles for further research and programmatic investments. When similar findings on the same theme emerged from different studies, attempts have been made to triangulate, highlighting nuanced differences and methodological variations.

Finally, while efforts have been made to triangulate findings with national data trends, state-level analysis and triangulation have not been conducted due to limited data availability. Any remaining errors or omissions are inadvertent and remain the responsibility of the authors.

³These documents were shared with the GxD hub, as part of its mandate to summarize the evidence and provide advisory inputs to the Foundation.

○ Key Insights

Synthesis of emerging evidence across access, trust, skills, use cases, and measurement to understand women's digital participation

03



3.1. Unpacking Digital Access: Why Access Alone Falls Short?

According to the GSMA, digital access is often defined in terms of physical access to devices, network coverage, and usage (GSMA, 2025).

In India, mobile phones remain the primary, and often the only way that people access the internet, especially women. Yet, as of 2025, only 36% of women in India owned a smartphone, compared to 58% of men, with women 38% less likely to own one than men. Further, 35% of female mobile internet users only access mobile internet by borrowing someone else's internet-enabled phone, compared to 7% of men (GSMA 2025). More recent data from NSS's Comprehensive Modular Survey on Telecom (CMS:T) confirms the gender gap: as of 2025, only 47.4% of women above 15 years own a smartphone compared to 70.7% of men (CMS-T 2025). Data from NFHS-5 also shows the rural-urban disparity: only 46.6% of women aged 15-49 in rural areas own a phone, compared with 69.4% in urban areas (NFHS-5 2019).

India has experienced one of the world's fastest mobile broadband expansions: 4G remains the dominant access technology, while 5G coverage now extends to 99% of districts and approximately 82% of the population, supported by over 4.6 lakh base stations (Nokia MBit Index, 2025). Not surprisingly, then, mobile phones remain the primary source of internet connection, with only 12.7% connected households relying on fixed or Wi-Fi connections (GSMA 2025). In terms of network coverage, internet penetration in India crossed 55% by 2025, and women now make up 42% of this user base. However, near-universal nominal coverage masks persistent issues of patchy and inconsistent connectivity. Mobile broadband performance varies significantly across regions, with semi-urban and rural circles experiencing lower speeds, indoor coverage gaps, and intermittent access.

Finally, in terms of usage, NFHS-5 (2019) shows that only 33% of women, compared to 57% of men, have ever used the internet, highlighting deep-seated gender disparities in digital engagement beyond access. Even among

mobile internet users, women demonstrate lower diversity and depth of use: GSMA estimates that women engage in an average of 5.7 different mobile internet activities daily compared to 6.5 for men (GSMA 2025).

Findings from the GE-DC portfolio synthesis are largely consistent with these secondary data trends. For example, in a population-level representative survey conducted by the University of Cape Town (UCT) with SHG and non-SHG women members in Bihar, only one-third of women aged 18-60 years own smartphones, while 42% reported having access to shared phones. The rates of phone ownership were found to be similar among SHG (55%) and non-SHG women members (53%). However, a notable finding is that non-SHG members own better quality phones compared to SHG members, though this should be placed in the context that SHGs are supporting the poorest, least educated, and least literate women in this sample (UCT – Bihar Study).

In a state-level representative study conducted in Meghalaya by GxD hub across rural and urban areas, it was found that 53% of women aged 15-59 years owned smartphones, ~10% had access to a shared phone only, and 23.2% did not have access to any phone (GxD hub - Meghalaya).

Bihar	Meghalaya
One-third of women aged 18-60 own smartphones;	53% women aged 15-59 owned smartphones;
42% reported access to shared phones.	about 10% had access only to a shared phone; 23.2% had no phone access.

Table 2: State-level Trends in Smartphone Ownership and Phone Sharing – Meghalaya and Bihar

Smartphone owners ⁴	Men	Women
Bihar, UCT	62%	31.5%
Meghalaya, GxD	69%	53%
Phone Sharers (i.e. have access to a shared phone only)	Men	Women
Bihar, UCT	14%	42%
Meghalaya, GxD	5.1%	10.3%

Two surveys in the portfolio, conducted by Resham Sutra with women weavers in Chhattisgarh, Meghalaya, and Assam, and by Jagriti with owners/operators of local communication hubs in Uttar Pradesh, similarly found that at least a of women only had access to shared smartphones, and that smartphones are often shared in 1:3 ratio (Resham Sutra; Jagriti). However, since these were purposive samples, these estimates are not representative.

Resham Sutra's study also noted that 'there was confusion amongst people about what it means to have their own phone as families frequently shared devices'. This potentially led to an under-representation of shared phones (i.e., phones shared by more than one individual) in the data, underscoring the need for nuanced, contextualized metrics and measurement guidance (Resham Sutra).

In urban India, according to one estimate, around 80% women own a smartphone (GSMA 2025). However, IIHS's study with urban informal workers found that only 64% women in the sample owned smartphones. **Even when women owned their smartphones, they were shared with other household members as smartphones are considered a shared household asset.** In this study, more than half of the smartphone owners (women & their spouses) shared their own phones with one or more household members (such as a child or spouse). Nonetheless, being a primary owner had a strong association with being a user (IIHS).

This is in line with data from the latest round of GSMA's survey (2025): In India, on average, mobile internet users who own an internet-enabled phone perform a greater number and variety of mobile internet use cases every day than phone sharers/borrowers.

An exploratory study by Aapti Institute on digital trust across urban and rural Uttar Pradesh, Odisha, Maharashtra, and Jharkhand further examined phone ownership in terms of the number of people who use the phone and the relationships and negotiations among the user, the phone owner, and/or other users. Findings indicate that women often gave their phones to their children for schoolwork and games, thereby curtailing their own use. The study further found that the user's relationship with the phone owner influenced their comfort, use, and self-censorship. For example, a shared household phone owned by the in-laws led to a different experience than sharing a device with a sister. Women's use of shared devices and the duration of their use were also shaped by prevailing gender and moral norms and expectations of propriety (Aapti Institute).

Thus, while the nature of access, network coverage, and diversity of use are important starting points for understanding meaningful access, together these studies provide a nuanced view of the quality of women's digital access. The sections below further explore:

- socio-demographic patterns in women's phone ownership and phone type,
- ways in which affordability and financial agency contribute to sporadic or inconsistent access and connectivity,
- duration for which women access phones, and
- how norms, intra-household relationships, and trust play a role in women's conditional and supervised access to phones.

⁴Data for Bihar are drawn from a survey conducted by the University of Cape Town (UCT), covering adults aged 18–60; data for Meghalaya are drawn from a survey conducted by the Gender and Digital Hub (GxD), covering individuals aged 15–59. Both surveys employed state-level representative sampling and comparable indicators. The Meghalaya sample includes respondents aged 15–17, who fall outside the Bihar sampling frame; figures should be interpreted with this difference in mind.

3.1.1. From Access to Impact: Understanding the Dynamics of Inclusion

A. Socio-Demographic Patterns in Phone Ownership

While access is often discussed as a binary measure of ownership in the literature, in reality, socio-demographic inequalities influence whether women own a device, the kind of device they can access (smartphone/feature phone), and how independently they can use it. National datasets reveal consistent divides across caste, wealth, education, age, and religion, suggesting that phone ownership is far from evenly distributed, with younger, more educated, and wealthier women more likely to own phones.

Age, education, household deprivation, marital status, caste, wealth, and religion influence whether women own a device, what kind of device they access, and how independently they use it. NFHS-5 (2019) data, for example, shows that having a mobile phone they themselves use among women is shaped by caste and wealth: only 51% of Muslim women, 48.3% of women belonging to the Scheduled Caste, and 40% from the Scheduled Tribes own a mobile phone. In contrast, ownership rises to 63.4% among women belonging to other castes, highlighting deep social and economic inequalities in phone access. CMS:T 2025 data reveal similar disparities, with women's ownership particularly low in rural areas and in central states such as Chhattisgarh and Madhya Pradesh.

Education level is another critical determinant: only 34% of women without schooling report phone access, compared to over 70% among those with ten or more years of education. Wealth follows a similar gradient, with nearly four in five women in the richest quintile owning a phone. Age also shapes access; for example, over 95% of mobile-owning youth (15–29) already possess smartphones (NSS). While none of the studies in the portfolio explored access vis-à-vis social identities per se, several studies found similar trends in digital access and device ownership vis-à-vis age, household deprivation levels, education levels, and marital status.

For example, among SHG members in Bihar, higher education levels and being married but not cohabiting with the husband were strong predictors of owning a phone: 84% of women who are married and not living with their spouse owned a phone. The study also found that women's phone ownership is linked with a household's perception of a net benefit in terms of economic, convenience, or improvement in family life. Finally, younger SHG women were more likely to use phones for high-impact use cases such as agriculture, health, and learning (UCT - Bihar Study).

Similarly, in the Meghalaya study, younger women (<25 years) were found to be more confident in using smartphones, and helped older relatives in navigating applications; older women users were significantly less likely to explore the phone beyond basic use cases such as calls and messages. Household deprivation levels were also strongly associated with low phone ownership, as we will see in the next section. IIHS's study found variations in use by urban informal workers, shaped by age, occupation, and household circumstances (GxD Meghalaya; IIHS). For example, younger tailors from better-educated families reported wider usage compared to domestic workers.

In the overall data as well, "more than common uses" (i.e., 3–4 use cases) was more prevalent in the 18–30-year respondent category, compared to those aged 31 and above (IIHS).



B. Affordability and Financial Agency

Affordability continues to be one of the critical barriers that deepens exclusion.

Among women who are aware of mobile internet but do not use it, 8% cite handset cost as their single most important barrier, and 9% report data cost as a key constraint (GSMA 2025). In the CMS:T 2025 data as well, among individuals (aged 15+) who did not use the internet in the last three months, around 12% reported cost of equipment or of service as one of the main barriers. While these proportions appear modest, they obscure deeper dynamics around how affordability and financial agency influence the nature of women's digital access.

The gender gap in device ownership is structurally reinforced by a household's socioeconomic status and intrahousehold resource allocations.

For instance, in Meghalaya's highly-deprived households, 53.4% of women did not own a phone, compared to 35.1% in moderately deprived households and 25.2% in the least deprived households. For women in such households, phone ownership drops by more than half compared to their peers in better-off families. The financial burden of smartphones is revealing: in highly deprived households with median monthly incomes of INR 10,000, the cost of a smartphone (around INR 8,000) represents nearly 84% of a household's monthly income. Thus, in the context of constrained household resources, phone purchases may be prioritized for members based on perceived household utility, typically men (GxD Meghalaya).

Affordability also shapes the type of device (button phones, feature phones, or smartphones) that women can access. While men are more likely to own smartphones, many women, especially in poorer households, depend on cheaper basic or feature phones or on shared devices. In UCT's Bihar survey, for example, around 28% of SHG members own a basic phone, which limits their ability to engage with digital payments or e-learning and increases their reliance on others for internet access. Further, the vast majority of women (80%) reported that their phones had been received as gifts or passed down from male family members, with independent purchases often limited to work-related needs (UCT - Bihar Study). This pattern repeats elsewhere:

in Meghalaya, fewer than two-thirds of women said they had paid for their phone, compared to nearly nine in ten men (GxD Meghalaya). Differences in the phone type and quality (storage and processing capacity) have a direct bearing on regular and meaningful access to digital platforms. Feature phones limit women's access to internet-enabled services, reinforcing the reliance on others for tasks beyond calls or messaging. Data from GSMA reinforces this pattern: nearly one in four women internet users perceive phone sharing as a barrier to greater usage in South Asia (GSMA, 2025). Research by Aapti Institute further found that shared phones with limited storage capacity (which itself is a function of affordability) restrict the number and type of applications that can be installed, leading to repeated cycles of installation, deletion, and reinstallation (Aapti Institute).

Affordability extends beyond the cost and quality of handsets to include ongoing expenses related to data recharges and maintaining connectivity.

- Evidence from the Meghalaya study highlights this gap clearly: 42% of women relied on others to pay for data, compared to just 9% of men (GxD Meghalaya). Similar patterns emerge in the UCT Bihar study: among the respondents who were unable to make outbound calls (25% of the sample),
- Affordability of credit (defined as 'someone will recharge the phone') was the primary constraint, cited by 17% of women compared to 6% of men (UCT-Bihar Study).
- In a similar vein, Aapti's study found that women frequently ration data or rely on shared hotspot connections once their data packs are exhausted.
- As the report further notes, the ability to purchase data packs and control or negotiate their consumption on shared devices determines whether access is adequate in practice (Aapti).
- Consistent with these findings, in the Meghalaya study, women who paid for their phones and data packs, were significantly more likely to use messaging apps and social media than those who relied on others, though their usage still lagged behind men (GxD Meghalaya).

Together, these findings suggest that financial decision-making power over devices and data, rather than ownership alone, can be a more reliable predictor of meaningful and sustained internet use.

Other studies, focusing on informal worker segments, further underline how affordability indirectly shapes usage behavior. IIHS's study found that older women and lower-income street vendors treated their phones as precious household assets, limiting their use for fear of theft, loss, or misuse. Even when smartphones were available, informal workers avoided subscription-based features, such as video editing tools, despite perceived benefits, due to recurring costs and reliance on others for recharges (IIHS). Findings from the Resham Sutra study with artisans echo these patterns. Among women who rely on weaving as a secondary source of income, the cost of owning and maintaining a smartphone remains prohibitive. Even in households where smartphones were available, access was often shared, with usage prioritized for male family members (Resham Sutra).

Together, these insights suggest that affordability needs to be conceptualized beyond initial device access, to include sustained financial agency over devices, data, and connectivity. Thus, policy and programmatic approaches to address affordability constraints need to account for whether women can independently purchase and sustain device use, and the quality of the devices, in order to translate access into meaningful and sustained digital participation.

C. Intermittent, Conditional, and Supervised Access

Measuring how many women own or have access to connected devices, while important, overlooks critical questions about who actually uses phones, how often, and for what purposes. Across studies in the GE-DC portfolio, women's access to smartphones and the internet emerged as conditional, intermittent, and needs to be negotiated within the household. Smartphones are seen as shared household assets, resulting in women's phone use being compressed into short and specific windows of time, typically ranging from one to three hours a day, with limited opportunities for continuous

or unsupervised access (Aapti, Afridi et al., 2025, GxD Meghalaya, UCT- Bihar Study). These findings have important implications for programs and interventions that assume consistent or independent access to digital devices by women.

Evidence across rural and urban contexts also highlights the gap between nominal access to devices and their actual use.

In Meghalaya, for example, 55% of women sharers report less than one hour of daily phone use, while only 9.2% of women owners face similar constraints. Around half of women sharers also report being unable to access their phones when they wish to, underscoring the constraints associated with shared access (GxD Meghalaya). The UCT study in Bihar similarly finds that women who share phones get very limited time to use them because the phone owner keeps the phone with him, often taking it out of the house throughout the day. Women phone sharers also noted limited discretionary time due to domestic work and low digital skills. Notably, around half of all respondents, both men and women, acknowledged a gender bias favoring men in permissions to use phones and access the internet (UCT- Bihar Study).

Constraints on women's phone use persist even in urban settings. According to the IIHS survey, on average, woman worker spends 120 minutes on a smartphone.⁵ **This holds true regardless of whether the phone is reportedly owned by the woman or not, indicating that personal ownership alone does not guarantee greater individual use.** In the same study, more than half the women respondents also reported sharing their device with one or more household members (such as spouses and children) irrespective of primary ownership status. This finding is further corroborated by Aapti Institute's study which notes that even when women own phones, they are considered shared household resources, prioritized for men or children as tools of work or education (Aapti).

Across studies, the review finds that **time spent on phones is also closely shaped by social norms, household supervision, and gendered roles, which govern appropriate digital behaviors and make access conditional and intermittent rather than continuous and autonomous.**

⁵Sample focuses on street vendors, domestic workers and tailors. Among the sample, 64% of women owned smartphones and out of those who owned smartphones, 84% reported being a primary user of smartphones.

In the Aapti Institute study, for example, across locations, women feared being perceived as engaging in ‘inappropriate digital behaviors’ and limited their phone usage as a result, while their male counterparts did not feel scrutinized as such (Aapti). Women also reported using the internet under family supervision, and have limited free time due to unpaid domestic and care work (IIHS). This norm-based regulation of women’s mobile use is also reflected in broader literature.

Barboni et al., for example, find that for women, mobile use remains community-regulated, with norms limiting both the duration and acceptable purposes of use (e.g., work, school, or urgent family matters) and limiting them to having prolonged or casual conversations (Barboni et al., 2018). This interrupted access to devices shapes other dimensions, such as women’s trust in digital platforms, their digital skills, and engagement with high-impact use cases.

Sporadic, supervised, and interrupted use limits women’s ability to develop the familiarity, trust, skills, and independence required for deeper engagement and experimentation (Aapti). Limited privacy within households constrains them from communicating personally, exploring sensitive topics, or accessing broader services related to health or finance. Many women also reported fear of leaving digital traces that could be seen and scrutinized by others (Aapti). In Meghalaya, even among phone owners, women had low rates of independent app downloads and deferred to male relatives for security management (GxD Meghalaya). Poor internet connectivity further compounds these challenges, as users struggle to distinguish between personal errors, connectivity issues, and application failures, contributing to uncertainty and the erosion of trust (Aapti).

Evidence across studies in this portfolio (UCT-Bihar Study, IIHS, Aapti, GxD Meghalaya) demonstrates that in practice, the shared nature of smartphones, the unequal distribution of unpaid domestic and care work, gendered norms of supervision and propriety, and limited discretionary time, influence women’s digital access. These conditions compress women’s digital engagement into intermittent and supervised fragments, constraining

opportunities to experiment, build skills, and move from basic connectivity to meaningful, independent, and sustained digital participation.

3.1.2. Shaping Pathways to Inclusive Access

Efforts to bridge the digital divide have been framed narrowly in terms of device ownership or network connectivity, overlooking deeper structural barriers of affordability, mediated access, and intra-household decision-making, which together constrain how and when women can engage with devices. In addition to phone ownership and availability, programs should measure the nature, duration, and frequency of phone usage, including privacy and permission dynamics. Unpacking access and autonomy in use of smartphones is critical because most skilling or livelihood initiatives may assume women to be a homogenous group who have sufficient daily access to practice or learn, when in reality, shared and supervised use and limited autonomy severely restrict the time they can spend online, digital trust, and quality of engagement.

Programs need to account for the diverse types and quality of phones women have access to, from basic or feature phones to smartphones with lower processing and storage capacity, which have implications for heavy apps or chatbots. Finally, given the shared nature of even personally owned phones, programs need to test safety-by-design UIs, enhanced privacy features (disappearing OTPs, multi-user login in apps) structured for multiple users, and lite or voice-first modes to account for patchy connectivity.

A further limitation lies in how success is still measured. Many programs continue to evaluate success in terms of device availability instead of autonomous use and agency.

Measuring how many women own or have access to devices overlooks critical questions about autonomous users who actually use phones, how often and for what purposes, the number of use cases, and privacy and safety in use. Without shifting these lenses, investments in connectivity and distribution risk underperformance, as they fail to capture the real barriers that restrict women’s digital participation.

3.2. Digital Trust and Safety: The Missing Link in Meaningful Participation

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"Digital safety is about preventing and reducing harm, including through moderating illegal or harmful content or conduct, driving responsible platform design and governance, or designing tools to empower users to tailor their online experiences."

(WEF Global Charter of Principles for Digital Safety, 2023)

"Digital trust is the confidence that an entity or digital environment consistently demonstrates competence and reliability, maintains robust security and a secure system architecture, fosters fair and honest practices, provides a positive user experience, complies with governance and regulatory standards, and ensures auditability and traceability of data and operations."

(Saveljeva et al., 2025)

”

Digital trust and safety in digital environments are increasingly being recognized as important factors that influence meaningful digital participation for non-native technology users. Additionally, as we saw in the preceding section, restrictive norms, family surveillance, and concerns over safety and reputation limit women's access to information, social connections, and economic opportunities, both online and offline.

The 2025 GSMA survey finds that in India, among respondents who are aware of mobile internet but do not use it, 32% of men and women reported scams or fraud as one of the barriers to adoption, and 29% reported 'strangers contacting me' as a barrier to usage. These two barriers are ranked nearly on par with other barriers, such as reading and writing difficulties, and affordability (handset cost). Among mobile internet users as well, a notable 39% reported scams or fraud as a barrier to

further use, second only to data costs. This was followed by information security (36%) and harmful content (34%) as the top barriers to further use.

In six of eight countries, including India, women were more likely than men to believe online harms happened because of their gender, which influences their willingness to explore new digital spaces (GSMA, 2025). This trend is also reflected in national crime statistics. Alongside harassment and cyber-bullying, cybercrime has risen sharply: the NCRB recorded 86,420 cybercrime cases in 2023, a 31% increase from the previous year, with nearly 69% linked to fraud and about 5% to sexual exploitation. Instances of financial fraud have escalated sharply as well, with over 36 lakh cases in 2024 resulting in losses of more than ₹22,800 crore, and card and internet frauds tripling in a year (RBI, 2024).

3.2.1. Understanding Trust and Safety from a Gender Lens

While research on digital trust has expanded since the mid-2010s, there is no widely accepted definition in the literature, and the term is used interchangeably with concepts such as cybersecurity, online harm, or digital safety. A systematic review by Saveljeva et al. identifies a few common themes across existing definitions: digital trust is understood as a form of confidence, in people, processes, and technologies, that a digital environment will function reliably, protect users from harm, and align with broader societal expectations (Saveljeva et al., 2025).

The World Economic Forum's Global Charter of Principles for Digital Safety emphasizes preventing and reducing harm, including through moderating illegal or harmful content or conduct, driving responsible platform design and governance, and designing tools that empower users to tailor their online experiences (WEF, 2023). The framework also lays down eight dimensions against which the trustworthiness of digital technologies can be operationalized and evaluated: cybersecurity, safety, privacy, auditability, transparency, interoperability, redressability, and fairness. Others, such as Marcial and Launer (2019), have proposed a narrower set of dimensions comprising safety, security, reliability, privacy, and data ethics.

Despite their comprehensiveness, these frameworks are largely gender-agnostic and do not adequately capture the digital experiences of women in the Global South.

Within the GE-DC portfolio, Apti Institute's research has focused on building a more gender centric conceptual understanding of women's trust in digital platforms, and identifies several knowledge gaps:

First, it argues that digital trust is often conceptualized through a technocentric lens that prioritizes reliability and security in platform design while overlooking user perspectives, particularly women's digital experiences in the South Asian context.

Second, current approaches frame trust as a static attribute of platforms and overlook the dynamic nature of interactions between the user and digital platforms, which evolves and requires active maintenance.

Third, within the South Asian and Indian context, trust in platforms and services of any kind operates not just at the individual level, but is mediated through collective interactions, within households and community networks.

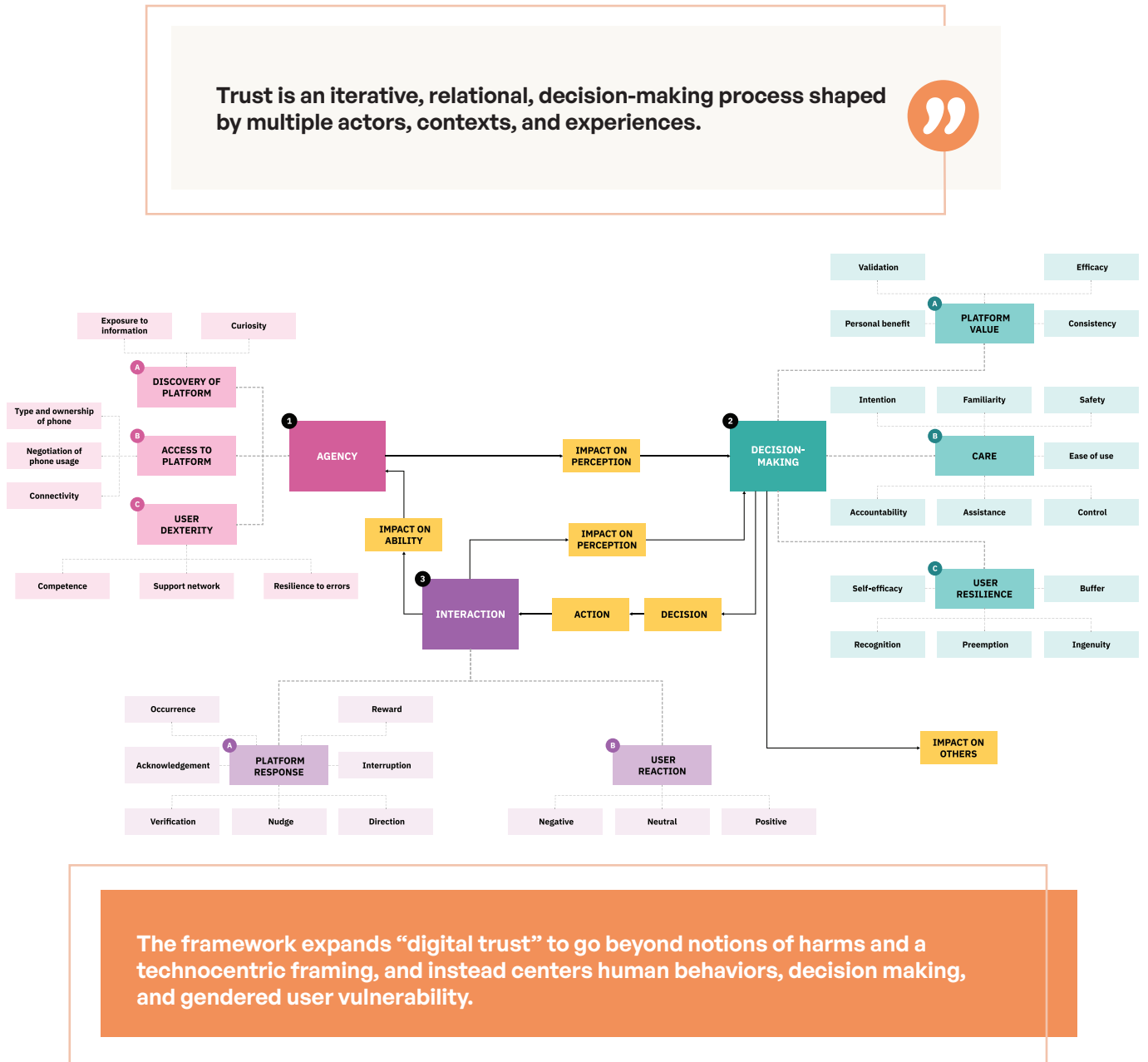
The study puts forth the following definition of digital trust:

"A user's choice to use technology, based on an expectation of allyship, where allyship refers to intentional care, learning, and reciprocity."

- Unbundling women's trust in digital platforms, Apti Institute.



Figure 2: Overview of Digital Trust Ontology (Apti Institute, 2026)



Apti’s ontology of trust offers a framework for understanding how trust in digital technologies is formed, negotiated, and sustained, particularly among low-income women users in the Global South. The ontology conceptualizes trust as an iterative, relational, decision-making process shaped by multiple actors, contexts, and experiences. This process is shaped by relationships between users, digital platforms, households, communities, intermediaries, and the state.

By recognizing that trust is influenced by a combination of factors, including technological performance, social norms, power relations, and technology-human/platform-user micro-interactions, the ontology maps pathways for analyzing how trust is built, tested, repaired, or withdrawn over time. In doing so, the framework expands “digital trust” to go beyond notions of harms and a technocentric framing, and instead centers human behaviors, decision making, and gendered user vulnerability. While other studies focus more directly on meaningful access or on skills, the study positions digital trust as the key determinant for shaping access, use, and capacity (Apti).

In this portfolio, several studies have examined the factors that influence and shape women’s digital trust, and move the needle beyond digital harms. The analysis below specifically draws on Apti’s and IHS’s research, while also triangulating complementary findings from other studies in this portfolio.

3.2.2. Factors Influencing Digital Trust & Safety

A. Household Dynamics and Mediated Access

As highlighted in section 3.1, **the restrictive nature of gender norms in South Asia influences women's use of mobile phones, and access and usage are strongly mediated by concerns about reputation, safety, and propriety.** For many families, these risks justify restrictions on women's access, especially for adolescents. As a result, phone use is often supervised, restricted to certain times or purposes, and shaped by household gatekeeping. Studies in South Asia show that women adopt "performative privacy practices," using devices under constraints that align with family expectations rather than their own needs (Acheampong et al., 2025).

Multiple studies from the GE-DC portfolio also find that women's digital engagement is mediated through family members and community networks, and intra-household decision-making and power dynamics. For instance, the IIHS study found that informal women workers in urban India largely relied on immediate and extended family members (especially spouses, daughters, sons, and nephews) for navigating digital services.

For specific use cases such as sending or receiving money via UPI and online banking/checking bank balance, more than three-fourths of women respondents depended on family members (immediate and extended) for assistance, while 14–22% reported government or government-adjacent mediators for assisting them with different online banking processes. Similarly, for accessing public services such as checking application status, registering a grievance, or obtaining information on welfare programs, nearly half of the respondents reported family members as the primary mediators, followed by 14–20% who relied on unions, and roughly 24–32% relied on government or government-adjacent mediators.

While these data points do not capture whether the role of these mediators is restrictive or facilitative, they indicate that women's navigation of the digital economy is not individual but deeply relational and depends on their immediate kin and extended network.

Expanding women's digital inclusion, thus, requires engaging these mediator networks, along with a focus on end users.

Another theme that emerged from IIHS's research was that women may hesitate to reach out for help with digital services out of fear of being ridiculed, having their usage monitored or questioned by family members, or being blamed for mistakes. This hesitation can be particularly pronounced in the case of financial missteps or errors, where women expressed apprehension about disclosing errors to family members for fear of being ridiculed. The survey further found that, in instances of financial fraud, women were more likely to seek support from mediators outside the household than for activities such as financial planning or finding a loan.

Further, the rates of "aided usage" across most digital tasks were strikingly low even where independent usage was limited, indicating that women were neither using services on their own nor seeking help. These patterns point to a cycle in which women's hesitation towards digital use is not merely influenced by a lack of confidence, but is driven by gendered norms, experiences and perceptions of failures on digital systems, and cemented through social penalties (IIHS).

This theme also emerged in Aapti Institute's research, which reported that women's trust in financial applications was closely tied to their husbands' attitudes and usage patterns. Women reported feeling more supported in using certain applications if their husbands explicitly permitted them to do so. This was especially evident in the case of digital payment applications, where women expressed trust primarily because their husbands trusted and used these applications (Aapti). Reliance on others to purchase devices, manage recharges, or approve apps, and shared phones exposing OTPs and financial data to family members undermines women's ability to build independent trust in digital platforms (Aapti).

B. Fear of Scams, Online Harms and Safety Risks

Multiple studies from the portfolio highlighted that women reported fear of fraudulent promises and schemes, and experiences of financial scams. While safety and security are a key barrier for both men and women as seen in the GSMA data above, women's perceptions and behaviors are shaped by further intersections.

What harms look like in practice from the portfolio:

- False home-based work offers targeting domestic workers and street vendors through Facebook and WhatsApp (IIHS)
- Fraudulent links, phone calls, and video calls promising recruitment for white-collar jobs (IIHS)
- Concerns around financial frauds and data misuse (IIHS)
- Social media surveillance, where posting photos or stories was seen as reputationally risky (Apti)
- Scams, harassment, and misuse of data pushing some women to withdraw from platforms (Apti and GxD hub)

In the IIHS survey, respondents across geographies such as Delhi, Jaipur, Hosur, and Anekal reported being engaged in fraudulent promises and schemes, some of which specifically targeted women. They also highlighted scams, including false promises of home-based work, particularly targeting domestic workers and street vendors by promising well-paying jobs, via Facebook and WhatsApp. Financial scams were also prevalent, including fraudulent links and elaborate phone and video call schemes that falsely promised recruitment for white-collar jobs (IIHS). Additionally, in urban settings,

women voiced concerns around financial frauds and data misuse. Women also reported instances of surveillance of their social media, with posting photos or stories seen as risky for reputational harm (Apti).

Experiences of fraud, mistakes, or financial loss have implications for women's willingness to continue using digital services. Fear of mistakes, ridicule, and reputational harm also limits women's digital usage to "safe" activities like making phone calls or cash payments, while social media or digital transactions are often avoided. For instance, the IIHS survey found that for cautious users, disengagement is driven by fear of inviting trouble or facing judgment from family, compounded by their lower ability to absorb financial losses (IIHS). In in-depth interviews conducted as part of Apti and GxD hub's research, women highlighted that scams, harassment, and misuse of data frequently push them to withdraw from platforms. Women expressed anxieties around "wrong" actions online that may damage family honor or invite gossip, while adolescent girls reported being restricted by fathers or brothers to avoid reputational harm (GxD Meghalaya, Apti).

Household monitoring and usage of shared phones heighten these risks, with Apti's research noting that limited awareness of safety features further reinforces dependence and distrust. Reluctance to use new digital services was often rooted in a fear of making mistakes rather than an absence of trust in the services themselves. However, the IIHS study noted a crucial distinction in how women navigate these challenges: women are more likely to reach out to mediators outside the household regarding financial fraud than for financial planning, prioritizing external professional trust over family members when fearing internal rebuke (IIHS).

Thus, women's perceptions and behaviors towards using digital services and platforms are uniquely influenced by gender norms, reinforced through failures of digital systems, and cemented through social penalties for the consequences of those failures.

C. Link between Access, Proficiency and Safety

Perceived digital safety is an important factor that influences women's use of digital financial tools like UPI to make payments.

For instance, women users pointed to limited exposure to financial decision-making, with restricted public and financial engagement shaping their confidence in assessing the credibility of digital services.

Findings from GxD hub's survey in Meghalaya also suggest that women are less likely than men to use UPI overall, with a caveat: willingness to engage in digital payments increases when users feel confident about sharing information online. This relationship is closely linked to digital proficiency (defined in the study as the ability to independently perform tasks like messaging using WhatsApp, making UPI transactions, and connecting to Wi-Fi): higher proficiency in digital use is strongly associated with higher safety scores, indicating that skilled users feel more secure navigating digital spaces.

Personal phone ownership is a key predictor of proficiency: nearly 90% of owners can use WhatsApp independently, compared to just 56% of sharers. Similar trends were noted for tasks such as downloading apps, taking pictures (making UPI transactions and connecting to Wi-Fi show even starker divides). Shared access is insufficient to support the development of full digital capability, particularly for tasks that require confidence, trust, familiarity, and autonomy.

These findings suggest that proficiency and ownership actively shape perceptions of safety, which in turn influence deeper digital and financial engagement (GxD Meghalaya). At the same time, research by Women's World Banking on UPI use has highlighted that even among women who own smartphones ("Cautious Balancers"), there is a hesitation to adopt digital payments due to concerns about security, fear of mistakes, and lack of control (Women's World Banking, 2024a).

Women's ability to mitigate risks associated with digital use is also a function of their skills and confidence in navigating different features, as well as their fear of ridicule.

According to GSMA data, only a quarter of women (26%) took action after being affected by a negative incident using mobile internet (GSMA, 2024).

Within the GE-DC portfolio, studies note differences in women's skill levels and their ability to navigate these settings. Among informal workers surveyed by IHS, women's ability to navigate privacy and safety features on digital platforms was notably limited. Only 20.3% could change privacy settings independently (an additional 3.1% with help), 19.5% could deactivate accounts on their own (an additional 2.6% with help), 34.3% could hide ads independently (an additional 4.9% with help), and 21% could identify sponsored versus unsponsored posts on their own (an additional 4.5% with help). Even for a relatively basic safety behavior like setting a phone PIN or password, a little more than half of the respondents (51%) could do so independently, and an additional 2.8% could do so with assistance.

Data from Bihar reveals that women are significantly less likely than men to use features such as blocking unwanted contacts or managing privacy settings, which are critical for safe online engagement: only 17% of women reported blocking someone on social media, compared to 44% of men. Even fewer women had taken steps to secure their accounts, with only 5% changing passwords or adjusting privacy settings, compared to 22% and 19% of men, respectively (UCT-Bihar Study).

Women's lower engagement with safety controls limits their ability to prevent or respond to online risks, reinforcing cautious or defensive digital behavior and constraining deeper participation. These intersections highlight that device access, usage patterns, digital skills, and trust are interlinked barriers that cannot be addressed in isolation.

3.2.3. What Works to Build Digital Trust? Early Insights and Directions

Findings from Aapti Institute’s human-centered design work offer early insights into factors that may support digital trust building; for instance, women can gain confidence when digital skills are linked to immediate needs, such as accessing entitlements or running small businesses and when opportunities for low-stakes, repetitive practice reduce the fear of mistakes (Aapti).

As noted in the previous section, digital engagement must be seen as a relational and dynamic, which deepens not through one-time interventions but through iterative, supported learning with relevant use cases. At the same time, Aapti’s digital persona mapping demonstrates that women’s digital trajectories are highly diverse. While some are cautious users who engage defensively, others experiment pragmatically, and still others rely almost entirely on trusted mediators (Aapti).

These distinctions underscore the limitations of uniform programming and call for persona-sensitive approaches that can adapt to differing motivations, readiness levels, and risk tolerances.

While women’s trust is shaped not only by functionality but also by reputational risks and fear of surveillance, safety further complicates the landscape. Addressing these concerns requires embedding safety and privacy features directly into design, while also normalizing women’s participation in digital spaces.

- Designing for Trust and Flexibility:** Aapti Institute’s work also explored how women’s trust can be strengthened when platforms allow them greater control and flexibility. Women build confidence when they can decide what information to share, how visible they are to others, and which interactions feel safe and secure. This shifts trust from dependence on intermediaries to a stronger sense of personal agency. When platforms embed such flexibility, for example, through gradual onboarding processes, private or low-visibility modes, or personalized settings, women are more willing to experiment and move from tentative to independent use.

Similarly, design elements such as vernacular language access, simplified interfaces, rapid functionalities, and reliable grievance mechanisms help reduce friction and build confidence in digital use. These design features do more than improve usability; they communicate that platforms are credible, inclusive, and respectful of users’ contexts (World Bank, 2023). **When women see that systems are designed with their realities in mind, it fosters confidence and trust not just in specific applications but in the digital environment more broadly.**

- Role of Mediators and Community Trust Building:** Across studies, trust in digital services is mediated through multiple layers of intermediaries, including household members (spouses, children, kin), women-led SHGs and federations, unions and worker associations, frontline workers, and peer or work-based networks, who function as translators, validators, and risk mitigators shaping women’s willingness and confidence to engage with digital platforms.

For instance, Aapti’s research highlights how women-led intermediaries not only reflect the state’s reliance on them, but also show that digital access is organized at the community level, serving as ‘trustees,’ translating state schemes into relatable and trustworthy engagements for women. Research by IIHS shows that husbands, sons, daughters, and other family members are the first line of mediation, but women also turn to external actors (such as unions and government adjacent mediators) when facing sensitive issues like fraud. Similarly, user research by Aapti identifies intermediaries as key enablers of digital trust, helping women navigate design barriers, explain risks, and create a sense of safety in contexts where households may be restrictive. Gatekeepers’ approval is key to trust: women report feeling safer and more willing to explore new apps when they have approval or encouragement from trusted male relatives.

Therefore, mediators/intermediaries serve as trust accelerators, bridging gaps between women and digital systems, and converting tentative, supervised use into more confident and sustained engagement.

Intermediaries such as SHGs, unions, and grassroots collectives also play a critical role by expanding women's networks beyond households, providing spaces to experiment and build confidence, and mediating both opportunities and risks. **Key recommendations from Aapti's work on trust in this regard include integrating peer-support systems into government platforms, e.g., creating a user and assistant profile, creating helplines and support systems rooted in community infrastructure such as SHGs or Anganwadis, and developing 'digital circles' that function as peer learning forums.** Another key aspect is to invest in enhancing the digital competencies of intermediaries through structured and accessible pathways (Aapti).

Building safe and inclusive digital ecosystems thus requires a layered approach: by treating trust as relational and iterative, embedding adult learning principles into training, tailoring interventions to account for diverse user personas and risk orientations, and leveraging mediators to bridge household and community barriers. These principles must be accompanied by investments in accessible interfaces, multilingual and voice-based functionality, privacy safeguards, and reliable grievance mechanisms, particularly in contexts of shared-device use and household surveillance.

3.3. Enhancing Digital Skills and Usage

Emerging evidence suggests that women's digital participation is not just shaped by access to devices, connectivity, and digital trust, but also by their digital skills, confidence, and capability to translate skills to meaningful use cases.

While women's mobile ownership in India may narrow the skills gap for basic functions like calling, gaps in higher-order use cases and advanced skills remain wide, pointing to a gradient of difficulty that can limit women's digital agency (Barboni et al., 2018) (Sharp, 2024). This pattern is further validated by GSMA (2025), which identifies literacy and digital skills as the single most important barrier to mobile internet adoption for 21% of Indian women who are aware of the internet but do not use it. Additionally, 27% of women aware of mobile internet report that it is not relevant to their lives and 27% cite insufficient support in learning how to use it more (GSMA, 2025) indicating that capability barriers extend beyond technical skills to include relevance and sustained support.



3.3.1. Mapping Skill Gaps

DigComp 2.2 and ITU Digital Skills Toolkit are widely used frameworks for classifying digital skills. While useful as reference points, neither fully captures in LMIC contexts. For this synthesis, we therefore follow the basic and intermediate/advanced skills classification proposed by UCT.

Digital competence means confident, critical, and responsible engagement with digital technologies.



DigComp 2.2:

The Digital Competence Framework for Citizens, developed by the European Commission, defines digital competence as “the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society.”

The framework comprises five competence areas that assesses 21 competencies:

- | | |
|-----------------------------------|------------------------|
| 1) Information and Data Literacy; | 4) Safety, and |
| 2) Communication & Collaboration; | 5) Problem Solving. |
| 3) Digital Content Creation; | (Varekai et al, 2022). |

DigComp 2.2 has four proficiency levels:

Foundation: Individuals remember and implement simple tasks with guidance as needed

Intermediate: Individuals identify and implement well-defined tasks and solve well-defined problems autonomously.

Advanced: Individuals assess and apply solutions to a variety of complex tasks autonomously and adapt to a variety of contexts to evaluate and execute tasks appropriately, guiding others if and as required.

Highly Advanced: Individuals assess, evaluate and resolve highly complex or specialized problems to create new solutions or adapt existing ones, leading and guiding others if and as required.

ITU’s Digital Skill Toolkit divides Skills Levels into three categories: Basic, Intermediate and Advanced (ITU, 2024):

Basic Skills include using a keyboard or touchscreen to operate a device, using software to download apps and create documents, completing basic online transactions such as making Internet searches, sending and receiving e-mails, filling out a form.

Intermediate Skills enable people to use technology in “meaningful and beneficial ways” (Broadband Commission for Sustainable Development, 2017, p. 27). In contrast to the more universal basic skills, a person will need different sets of intermediate skills depending on their goals, needs, and their vocation. For example, depending on the type of job, a person may need digital graphic design skills in addition to word processing.

Advanced Skills involving specialized expertise such as programming, AI, data science, and cybersecurity.

Findings from the portfolio studies reviewed indicate that women’s engagement with digital devices and platforms was clustered around basic skills and use cases.

Higher-order digital use appears to be influenced by factors such as autonomous and confident usage, and the ability to exercise control over digital interactions. Standardized digital skill assessment frameworks such as the DigComp have been primarily developed to assess computer-based competencies in European contexts, and do not fully reflect the nature of digital engagement in LMICs. In practice, as noted in the previous section, digital access in LMICs is often mobile-first, intermittent, and socially mediated, shaped by shared device use, platform-driven interfaces, and constraints related to literacy and language.

The studies in this portfolio examine how women engage with digital technologies across different contexts, focusing on access conditions, skill levels, and patterns of use. In UCT’s Bihar survey, basic digital skills refer to skills such as routine communication, saving a contact, opening an SMS, writing/sending SMS, blocking a number, audio prompt/IVR and locking the phone.

Evidence from Bihar highlights this skill divide: a gender gap of roughly 10–30 percentage points was observed in the ability to perform basic digital skills, with men able to perform approximately 60% of assessed skills compared to 30% among women. While 91% of men can make a phone call, only 73% of women are able to do so. Similarly, the gap widens for text-based communication, with 51% of men able to send an SMS or WhatsApp message compared to just 25% of women ([Digital Skills amongst men and women in Bihar: Summary Findings](#)) (UCT - Bihar Study).

Findings from GxD’s Meghalaya survey further suggest that skill levels are linked with the nature of ownership and access: nearly 90% of women who owned phones could send messages independently, compared to 56% among women who shared devices (GxD Meghalaya). Among urban informal women workers, findings from the IIHS survey indicate that close to half of the sampled women could send an SMS independently, more broadly, age was a significant factor in digital proficiency across the sample – 85.6% of women aged 43 and above were limited to ‘common uses’ of device (i.e. 2 or less uses like calling, SMS), compared to 45.9% of women aged 18–30,

suggesting older women across all sectors faced greater barriers to independent digital use.

The Resham Sutra study with weavers in Assam, Meghalaya, and Chhattisgarh identifies language accessibility as a barrier and found low awareness and ability to use relevant regional language keyboards. In Assam, 48% of women weavers reported being unable to type in their spoken language on a phone; this proportion rises to 62% in Meghalaya and 83% in Chhattisgarh (Resham Sutra).

The IIHS survey also highlighted this gap: one in four women reported being able to read or write in English, while most apps and devices default to English interfaces (IIHS).

Intermediate and advanced digital skills refer to higher-order competencies including skills related to digital transactions (such as mobile banking, online shopping, using Paytm/Google Pay), social media use, e-governance (e.g. applying for government scheme), education (including searching the internet), safety and security skills, internet connectivity, communication and collaboration (such as downloading an app, sending media via app), and digital content creation (photo/video) ([Digital Skills amongst men and women in Bihar: Summary Findings](#)).

Across studies reviewed for this synthesis, gender gaps widen substantially for these intermediate and advanced tasks. In Bihar, men recorded a mean competency score of 7.4 compared to 3.7 among women, suggesting men on average perform twice as many assessed skills as women. Further, only 18% of women reported being able to download an application compared to 49% of men, and while 55% of men could search the internet, only 34% of women possessed this skill. Use of digital payments and banking showed a similarly pronounced gap, with 42% of men having used platforms like Google Pay or Paytm compared to just 7% of women and 44% men used mobile banking compared to just 7% of women (UCT-Bihar Study).

Studies in the portfolio also capture the gap between awareness of digital features and the ability to perform specific tasks such as making calls, sending messages, searching the internet, downloading applications, using social media, or conducting digital payments without assistance.

Data from Bihar illustrate this well: for most skills, the gap between ever having performed a task and performing it independently was very small, suggesting that women who engage with a skill largely do so on their own. However, for less frequently practiced skills, a more pronounced gap emerges: 11% of women reported having ever created a social media account, but only 6% had done so independently. Similarly, 13% had ever made an online purchase compared to 9% who did so by themselves. This points to residual dependence on others precisely for the skills that carry the greatest potential for economic and social participation.

In Meghalaya, while 51% of women reported being able to download applications without help, only 19.5% could make UPI payments independently, indicating that familiarity with smartphone functions does not consistently translate into transactional autonomy (GxD Meghalaya). Among urban informal women workers, IHS documents a similar gap between familiarity and actual usage. While around 40% of sampled urban informal workers could download an application independently, only 27.4% could send digital payments via UPI on their own. Among the tasks where women most frequently sought assistance, banking and UPI transactions stood out — women were more likely to reach out for help with sending money, receiving UPI payments, and checking bank balances than for most other digital tasks.

The report also suggests that even aided usage rates were generally low, not because women were managing independently, but because many were neither using these features on their own nor seeking help.

Collectively, these findings point to a skill divide that persists alongside intermittent and mediated access. The notable drop-off from basic communication to intermediate/advanced use suggests that technical literacy alone may be insufficient for meaningful inclusion. A comprehensive, graduated approach is needed to address additional barriers related to trust, safety, financial autonomy, and social norms.

Gaps in intermediate and advanced skills, such as the ability to download apps or search the internet, are also important to factor in when designing digital or AI-based solutions for specific use cases such as health, agriculture, and finance.

3.3.2. Identifying Barriers to Skilling and Advanced Use

Skilling outcomes for women are shaped by the nature of access to digital devices (intermittent and mediated), education and literacy, program design and delivery, and training content. These aspects interact with social and psychological factors to determine whether skills translate into confident, independent use.

The Bihar survey assesses factors associated with high digital skills score among women and finds that literacy, education and age are closely linked to having higher levels of digital skills. Literate women with graduate-level or higher education have higher odds of having high digital skills. Additionally, being older than 40 years of age slightly lowered the odds of having high skills. Moreover, among those without any phone access, 46% of women and 60% of men cited lack of digital skills as the primary reason. However, among phone sharers, 27% of women cited skill deficits as the main barrier to owning their own device (UCT- Bihar Study). This points to situations where households may be reluctant to allocate devices to women perceived as unskilled, particularly where concerns exist around accidental damage, misuse or financial risk. In such cases, skill deficits operate as a gatekeeping mechanism rather than a downstream outcome of exclusion.

Program design features also appear to influence who is able to participate meaningfully in digital skilling initiatives. Quicksand's work highlights that many skilling programs rely on standardized 'one-size fit all' delivery models that assume similar levels of confidence, time availability, and agency among participants. These designs may be less accessible for women who face time poverty, mobility constraints, or informal permission structures within households (Quicksand).

The relevance of training content further shapes uptake and sustained engagement.

Evidence from Karya's study with rural annotators shows that approximately 30% of training sentences were misaligned with the cultural or social contexts of rural India, limiting comprehension and usability (Karya). Patterns of supervised or shared access also constrain opportunities for skill development.

Apti's participatory research similarly finds that confidence tends to develop in environments that allow safe experimentation, whereas monitored or conditional access can lead women to self-censor their use and restrict engagement to socially sanctioned activities (Apti).

Psychological barriers further interact with these constraints. As noted in section 3.2, fear of making mistakes, incurring financial loss, or facing ridicule emerges as a significant deterrent. Apti's research notes that this fear translates into anxious behaviors where women internalize the blame and become highly reluctant to engage in financial transactions or explore new platforms independently (Apti).

In the Resham Sutra study, women weavers frequently expressed anxiety about damaging phones or being laughed at for errors, with statements such as "I am afraid I might press something wrong and spoil the phone" and "I feel embarrassed if someone laughs at me." Such fears can discourage independent use of new features and reinforce reliance on others, slowing progression toward more advanced digital tasks (Resham Sutra).

Overall, evidence suggests that barriers to digital skilling can reinforce one another. Constraints related to skills perception, program design, contextual relevance, supervision, and fear interact to shape whether women are able to move from exposure to confident and independent digital use.

3.3.3. Digital Skilling Interventions: Evidence on What Works

Across the studies reviewed, digital skilling interventions appear more likely to translate into meaningful use when skills are linked to livelihood value, when women can apply them without fear of sanctions or errors, and when learning takes place in environments that reduce social and usability barriers. Rather than isolated technical training, effective approaches tend to combine relevance, confidence-building, and support structures that enable sustained engagement.

- **Linking skills to livelihoods and tangible value:** A randomized evaluation of a vocational training (VT) and digital and communication skills training (VTP) program in the beauty sector for women, in Delhi and Bangalore, followed 1,857 women over a ten-month period (N=679 in Delhi and N=1,178 in Bangalore). The training included classroom and on-the-job components.

Participants within each training batch were randomly assigned to one of three groups:

- (1) vocational training focused on technical skills,
- (2) vocational training combined with PBEL (digital and communication skills), or
- (3) a control group that did not receive training.

Women in the VTP group (combined training) were 9.6 percentage points more likely to be self-employed compared to the control group. Furthermore, they worked seven additional days over the last 90 days compared to the control group. This indicates that **digital skills gained traction specifically when they supported income-generating activities (DP-WEE)**. Resham Sutra's research with women weavers similarly found that motivation to adopt digital tools increased when skills were tied to concrete business functions such as checking material prices or sharing product photos (Resham Sutra). Complementing this, evidence from IHS highlights that the adoption of such livelihood-relevant skills is often unlocked by community mediators. For instance, women tailors were found to use social media for trendspotting and creating work portfolios, and UPI for paying EMIs, specifically when these practices were mediated by skills centers (IHS).

Thus, the relevance and sustainability of digital skilling programs may be enhanced when they have a direct link with income generation or work-related outcomes.

Jagriti's experience with micro-entrepreneurs further highlights the potential limits of technically ambitious interventions, noting challenges when business or digital models appear to exceed participants' readiness, leading to disengagement rather than progression. These findings suggest that technical skill acquisition may be most effective when paced and anchored in existing capabilities (Jagriti).

- Building Foundational & Advanced Skills:** Evidence from the portfolio points to the importance of mapping and enabling gradual skill progression to advanced use. UCT's analysis shows that women with higher Digital Access and Use (DAU) scores were more likely to use phones for higher-impact activities and demonstrated stronger outcomes related to savings behavior, loan repayment, and decision-making. This gradient suggests that programs need to design graduated pathways from basic to advanced use and factor in the relevance of use cases.
- Overcoming Literacy & Design Barriers: Literacy constraints appear to shape how women engage with digital tools, often influencing whether use is independent or mediated.** Resham Sutra documents how low literacy among women weavers seemingly limited navigation of text-heavy interfaces, constraining tasks such as messaging buyers or managing payments without assistance. The findings suggest higher usability when training formats are aligned with women's existing communication practices, including the use of regional languages, audio-visual formats, and familiar platforms such as WhatsApp (Resham Sutra).

Evidence from Karya's work similarly points to the risks of design misalignment: around 30% of standard sentences were found to be culturally or contextually irrelevant to rural women, which reduced comprehension and hindered engagement (Karya).

Evidence from Bihar establishes education as the leading determinant of high digital proficiency among women who own phones.

The predicted probability of a woman possessing 'high digital skills' remains negligible (~1%) for those with no formal education and rises only marginally to ~2% for those with primary education. A significant shift in possessing high digital skills is observed with higher education, where the probability jumps to ~23%, underscoring that intuitive design alone may not suffice to bridge the gap for the least literate users (UCT-Bihar Study).

- Role of intermediaries:** Intermediation also emerges as a recurring feature of women's digital engagement. As noted above, IIHS's survey shows that urban informal women workers relied on peers, collective leaders or family members to complete digital payments, verify transactions, or access government services (IIHS). Aapti's research similarly highlights that community and state intermediaries (such as ASHAs and BC Sakhis) act as crucial 'proxies for digital experiences,' creating a safe and familiar buffer that helps women navigate complex digital welfare and financial systems (Aapti).
 - Designing gender-intentional skilling programs:** Quicksand's study, which included a gender audit of existing digital skilling programs and consultations with practitioners and ecosystem partners, produced a set of design principles and a publicly available [playbook](#) for embedding gender intentionality in program design. Key principles include segmenting learners by skill level and motivation rather than using one-size-fits-all cohorts, connecting digital skills to everyday use cases relevant to women and their families, integrating safety and fraud awareness into curricula, employing women trainers, and designing for continued post-training support.
- The playbook operationalizes these insights into a practitioner-facing resource, making it a useful output for direct application by program designers (Quicksand).
- Designing user-centric and accessible content:** Usability appears to improve when digital design aligns with women's linguistic and social realities.

Resham Sutra notes that audio-visual formats and vernacular voice-overs reduce barriers for low-literacy weavers (Resham Sutra).

Aapti's research expands this to include safety and privacy. The study indicates that for women navigating household surveillance, design features such as disappearing or temporary content offer essential control over their digital footprint. Furthermore, the study suggests that interfaces should be designed to support safe exploration and trial-and-error, which allows women to build confidence without the fear of making mistakes (Aapti).

Evidence across studies suggests that enhancing device ownership and affordability, thus, is a necessary but not sufficient lever to bridge the digital divide.

Learnings from the portfolio also highlight that measuring approaches for digital skilling must capture outcome signals such as sustained independent use, diversity of digital activities, and relevance to daily use cases such as livelihoods. These gaps are examined in section 3.5.

3.4. Identifying High-Potential Use Cases

India's expanding digital public infrastructure has resulted in digital tools being embedded more deeply into daily transactions, from platforms such as Unified Payments Interface (UPI) and DigiLocker to Ayushman Bharat Health Accounts. Networks such as the Open Network for Digital Commerce (ONDC) are reshaping how small producers and enterprises participate in digital markets.

India's Expanding Digital Public Infrastructure

UPI crossed 20 billion monthly transactions in August 2025.

UPI transaction value stood at about ₹24.85 lakh crore.

DigiLocker had over 465 million registered users.

Nearly 79.9 crore ABHA IDs had been created.

ONDC mobility share rose from 40% to 56% between October 2024 and March 2025.

Only 17% of women report using mobile internet for business purposes, compared to 38% of men.

Despite these advancements, women's digital engagement with advanced, productivity-enhancing functions and high potential remains uneven. **A use case may be considered 'high-potential' if it can improve outcomes related to women's economic agency and empowerment, such as increased income, time savings, or improved access to services; strengthen women's ability to act independently: making decisions, transacting without intermediaries, managing risks, and navigating platforms with confidence.**

As noted in section 3.3, at the foundational level, digital usage is concentrated around phone calls, SMS, and WhatsApp, which serve as entry points for connectivity.

Intermediate uses include internet search related to education, health, and public services, and downloading apps. More advanced and potentially transformative and high-impact use cases, such as digital payments, social media for enterprise, and access to entitlements note uneven adoption, with persistent gender gaps. For instance, only 17% of women report using mobile internet for business purposes compared to 38% of men (GSMA, 2025), highlighting the drop-off between access and economically productive use.

Artificial intelligence adds a new layer to this picture. AI-driven credit scoring, fraud analytics, health triage, and counseling or advisory tools will deliver equitable benefits when women already transact digitally, hold ABHA IDs, and operate safely on personal or shared devices.

3.4.1. Sectoral Pathways and Potential High-Impact Use Cases

A. Digital Payments and Financial Services

The broader barriers of shared access, limited autonomy, and mediated trust become particularly consequential in high-stakes use cases such as digital financial services. Inclusive finance and public transfers often emerge as the most visible pathways for women's productive digital participation, yet evidence shows that uptake is uneven, and shaped by a combination of skill, negotiation of privacy, and mediated trust.

The broader patterns identified across this review, shared and mediated access, limited autonomy over devices, and trust shaped through household and community relationships, become particularly consequential in the context of high-stakes use cases such as digital financial services.

The GxD Meghalaya study reveals a stark usage gap: while 53.2% of women own smartphones, only 19.6% report being able to make UPI transactions without assistance, compared to 27.6% of men. This gap widens significantly based on device access; among women who own smartphones, 34% can transact independently. This number drops to 8.8% among those who rely on shared devices (GxD Meghalaya).

Apti's research further indicates that shared-phone arrangements and household oversight can discourage women from experimenting with digital finance. Insights suggest that when a borrower relies on a husband's phone, she may feel intimidated by the app and fear making mistakes, often depending on others to complete transactions rather than learning the process herself (Apti).

On the other hand, IIHS's study finds that while UPI apps see substantial uptake, engagement with traditional banking apps remains low, and use of government platforms like DigiLocker is negligible (IIHS). This points to a reliance on intermediaries and collectives to navigate not just payments, but the broader, digitalized ecosystem of government benefits and formal financial services.

Research by CGAP suggests that women may discontinue use after a single negative experience, such as a failed transaction or unexplained deduction. The findings indicate that losses loom larger than gains, with failed attempts potentially increasing dropout rates and creating friction within the household. Women often resume use only when reassured by social proof or trusted agents (Apti) (Chalwe-Mulenga, Bin-Humam, & Duflos, 2022).

Apti Institute's work reflects similar emotional barriers, where borrowers express worry that money might disappear if a wrong button is pressed. A user may pause use after a confusing attempt, re-engaging when a trusted peer such as a sister-in-law, guides her through the steps.

As financial platforms expand toward AI-based services such as underwriting, credit scoring, and fraud detection, the depth of women's control over devices and consent practices appears increasingly relevant.

B. Livelihoods and Entrepreneurship

Evidence from multiple studies in the GE-DC portfolio suggests that while digital connectivity opens doors to livelihood opportunities and markets, economic gains are often mediated by specific platform features, support networks, and the ability to navigate digital barriers.

For instance, Resham Sutra's study highlights that weavers are particularly interested in selling through social media platforms such as Facebook, Instagram, and WhatsApp, with peer assistance appearing to play a key role in fostering community-led learning and reducing dependence (Resham Sutra). Complementing this desire for market linkage, Apti's research identifies YouTube as a widely used tool for self-directed upskilling. Women across their study reported utilizing the platform not just for personal interests, but to acquire new vocational skills that directly support their economic and entrepreneurial aspirations (Apti).

However, sustaining this digital momentum remains a challenge. Jagriti's work indicates that businesses often encounter operational challenges within the first 3 to 6 months, which can lead to dropouts, particularly where peer networks are weak (Jagriti). In the livelihoods sector, new AI tools promise to help small sellers reach more buyers. However, Karya's research on Indian languages points to a hidden barrier: as common digital interfaces and platforms continue to be trained and built using standard English or formal Hindi, limiting their ability to accurately interpret regional dialects and terms commonly used in rural settings (Karya).

C. Health Services

Innovation in digital health systems holds the promise of strengthening last-mile service delivery, improving continuity of care, and expanding access to health information and entitlements. Yet emerging evidence from this review suggests that women's engagement with health systems, and digital health interventions in particular, remains limited and uneven.

In Meghalaya, the GxD study indicates that while 80-90% of households interact with frontline workers such as ASHAs, the direct uptake of user-facing digital health apps remains limited (e.g., only ~11% of households reported using the ABHA app). Instead, users appear to prefer offline, trusted intermediaries over digital interfaces (GxD Meghalaya).

Data from UCT's survey in Bihar similarly suggests that while the prevalence of health-related use cases is higher among Cluster Level Federation (CLF) leaders (75%), only a third of SHG members and 40% of non-SHG members reported using mobile phones for health-related purposes. The most commonly reported health-related use case was using the mobile phone for audio calling ASHAs/ANMs or the doctor. Only 10% of SHG members and 30% of CLF leaders reported using the phone to search for health information. Use of the phone to pay for health insurance or submit insurance claims was almost negligible across the sample.

Apti's research adds another layer to this dynamic: in shared-device households, privacy emerges as a significant concern, as messages or notifications intended for one person can be accessed by others, potentially exposing sensitive reproductive or mental health information (Apti).

As digital health platforms begin incorporating AI-enabled diagnostics and decision-support tools, these issues of privacy and consent gain further importance. These technologies rely on accurate, voluntary data input, which depends on women's trust and comprehension of consent flows. When access is mediated through shared phones or when notification shielding is absent, even well-designed AI features may risk amplifying existing vulnerabilities and gaps.

The outcome signals for meaningful participation in digital health are not only the number of ABHA IDs created but also whether women can complete private consultations, save time at facilities through paperless registration, adhere to care protocols, and resolve grievances through trusted redress channels. Without such measures, aggregate infrastructure growth risks overstating the equity of digital health adoption.

3.4.2. Factors Influencing Adoption and Use

Emerging evidence from the studies reviewed for this synthesis points to factors that influence whether women move from basic digital use to higher-impact adoption and experimentation. However, these relationships are not yet fully understood, and further research is needed to clarify their direction, strength, and interaction effects across contexts.

- Age & Education:** Across multiple studies, age and education emerge as important correlates of confidence, diversity of use cases, and experimentation. For instance, data from Meghalaya shows that younger respondents (<25 years) are more confident and assist older relatives in app use (GxD hub, Meghalaya); IIHS's study with urban informal workers finds that younger women (18-30) reported more wider use and no. of use cases than other age groups (IIHS).
- Nature and duration of access:** The quality, predictability, and duration of access significantly influence opportunities for experimentation and productive use cases. Device sharing, documented extensively across studies in the portfolio (UCT-Bihar Study, GxD Meghalaya, Apti, and IIHS), limits exposure to diverse use cases and reduces the likelihood of independent experimentation. Women who are secondary users often report restricted time windows and limited privacy, which constrains trial-and-error learning. In Meghalaya, women sharers were significantly more likely to report less than one hour of daily use compared to owners, reducing opportunities to explore unfamiliar applications. In Bihar, UCT found that SHG members with higher Digital Access and Use (DAU) scores demonstrated better Women's Economic Empowerment (WEE) outcomes, suggesting a positive association between consistent, autonomous access and higher-impact engagement.
- Financial autonomy:** Financial control over devices and data emerges as a strong predictor of meaningful use.

The GxD Meghalaya study found that women who independently paid for their phones and data were significantly more likely to use messaging apps, social media, and digital services than those dependent on others for recharges (though still less than their male counterparts). Women who relied on others to purchase devices were less likely to use the internet consistently. This suggests that financial decision-making power, rather than ownership status alone, shapes both the frequency and depth of engagement. Independent control over data recharges may also reduce self-censorship and negotiation barriers within households, enabling women to explore applications beyond socially sanctioned domains. UCT's findings in Bihar further indicate that women who own basic phones are structurally limited in their ability to experiment with higher-order use cases such as digital payments or online services, reinforcing the link between device quality, financial autonomy, and adoption.

- Assisted onboarding and safe spaces to experiment and learn:** Aapti Institute's participatory research highlights that women are more willing to experiment when platforms offer predictable responses, low-stakes interactions, and design features that reduce the fear of mistakes. Women navigating shared-device environments reported avoiding unfamiliar applications due to concerns about pressing the "wrong" button or leaving digital traces visible to others. Safe exploration environments—whether through peer learning groups, SHGs, or structured training sessions—appear to reduce these anxieties. These findings suggest that experimentation depends on a range of factors including technical skill, perceived safety, social acceptance, and confidence. Simplified onboarding through vernacular prompts, grievance channels and easy KYC emerges as crucial to prevent early abandonment (Agarwal & Jain, 2022). Women's World Banking adds complementary evidence, indicating that female agents can contribute to sustaining digital financial service (DFS) adoption. Their programs suggest that women report greater confidence when female agents guide the first transaction, likely due to a combination of technical

clarity and lowered reputational risk. The assurance that errors will be managed in a supportive environment appears to reduce intimidation and promote ongoing engagement (Women's World Banking, 2024b).

- Relevance and tangible economic value:** While entertainment and communication apps such as YouTube and WhatsApp serve as entry points to digital engagement, progression toward higher-impact, productive use cases appear contingent on perceived relevance and economic value. Resham Sutra's work with women weavers found that motivation to adopt digital tools increased when linked directly to business functions such as checking raw material prices or sharing product catalogs via WhatsApp (Resham Sutra).

Similarly, the DP-WEE evaluation demonstrated that integrating digital and communication skills within vocational training improved employment outcomes and productive use of social media for work (DP-WEE). Jagriti's experience with micro-entrepreneurs indicates that digital models gain traction when clearly aligned with livelihood pathways, but dropout rates increase when operational challenges are not addressed through sustained support (Jagriti). Aapti Institute's research corroborates this insight through its platform value dimension, emphasizing that for women to increase digital adoption and overcome inherent risks, platforms must demonstrate tangible benefits that meet their needs and desires (Aapti).

Across finance, livelihoods, and health, the portfolio demonstrates that high-potential use cases share common characteristics: they generate tangible economic or service-related benefits, strengthen autonomy, reduce time burdens, and enhance women's ability to transact independently.

However, adoption and sustained impact depend on interrelated factors including device control, digital proficiency, trust and safety, financial autonomy, language accessibility, and safe environments for experimentation. It is important to note that, while findings from this synthesis highlight promising pathways, **the evidence base for high-impact digital use cases for women remains relatively thin.**

Much of the current literature, including within this portfolio, documents early adoption patterns. **A more systematic and complementary review of broader academic and policy literature, alongside longitudinal experimental studies, is required to strengthen understanding of what constitutes sustained, high-impact digital participation across contexts.**

3.5. Measuring What Matters

3.5.1. Measurement Blind Spots

Networked device ownership is not binary, digital access is not continuous, and digital trust is not a given. As seen in this synthesis, for women, networked device ownership is not binary, digital access is not continuous and autonomous, skills are not the same as confident and meaningful use, digital trust is not a given, and data on online harms and digital failures obscures the real extent to which it can disengage women. However, mainstream surveys and existing metrics do not adequately account for these nuances.

Across GSMA Mobile Gender Gap Reports and India's national surveys (such as NFHS and NSS's Comprehensive Modular Survey: Telecom⁶), **digital inclusion is predominantly captured through binary indicators of ownership and recent internet use, offering limited insight into the quality of access and conditions under which women access and engage with digital technologies.**

While these measures are useful for national and global benchmarking and macro-trend tracking, they systematically overlook gender-critical dimensions, including women's control over devices (in terms of time use, predictability of access, privacy, socially 'acceptable' or proper use cases and digital behaviors, amount of data available, primary vs secondary user), quality of access (internet stability, storage/processing capacity of devices), affordability trade-offs, graded and observable mobile-first skills, safety practices and exposure to online harms, and the influence of social norms on digital participation. Measurement initiatives such as the Oxford Gender Gap Dashboard (Digital Gender Gaps, n.d.) and the WiDEF initiative (WiDEF, 2024) have attempted to move beyond ownership and penetration by incorporating multidimensional indicators, including

affordability, relevance, agency, and skills. These approaches mark important progress, yet they face clear limitations when applied to South Asian realities.

Most global and national frameworks continue to treat the individual as the main unit of measurement, even though evidence shows that women's access is shaped by household norms, permissions, and mediation. Internet in India 2023 data, for example, show that the proportion of people who access mobile services through someone else's phone has been rising, which means simple ownership indicators are increasingly misleading for women (Kantar & IAMAI, 2024). However, as demonstrated above, existing tools rarely capture proxy use, sharing patterns, or layered forms of mediated access.

Overall, these blind spots that characterize the current digital measurement ecosystem and how different indicators are operationalized can be clubbed into:

- (i) meaningful access,**
- (ii) skills and capability, and**
- (iii) digital trust, norms, and online harms**

(i) On meaningful access:

Across contexts, women who appear connected in headline statistics often experience restricted, mediated, or conditional access that limits independent and sustained use.

Recent literature argues that treating digital inclusion as physical access alone is analytically insufficient for goal-setting and policy design, and proposes focusing measurement on a small set of core components that are measurable and policy-relevant, such as quality of access, use, and affordability, with deliberate disaggregation to surface within-country inequalities (Sharp, 2024).

⁶ See: NSS CMS:T Schedule questionnaire and Survey Methodology document (80th Round, Jan–Mar 2025); GSMA Mobile Gender Gap Report methodology; NFHS-5 and NFHS-6 questionnaires.

Barboni et al.'s research (2024) reinforces this by defining phone access not just as ownership, but as a spectrum including borrowing for use, noting that ownership itself is often not sustained due to household rationing. The study underscores how people access the internet shapes what they are able to do with it.

However, global surveys like GSMA typically only ask whether a respondent personally owns a mobile phone or has used mobile internet in the last three months, establishing adoption but not whether access is regular, private, affordable, or autonomous, nor whether it is constrained by sharing, surveillance, intermittent connectivity, or data scarcity. Similarly, national surveys like NSS-CMS: T capture whether the 'household' has any internet access or whether an individual used the internet recently (last three months), which conflates availability with control and obscures intra-household gender inequalities. This also does not give an accurate picture of active, regular users.

As already noted, measurement needs to consider not only technical connectivity, but also modes of access, including shared or mediated use. This is particularly important in developing country contexts, where patterns of internet use differ from those assumed in survey instruments designed for high-income settings (Sharp, 2024).

(ii) On skills and capability:

There is a wider concern in the literature that measurement of digital skills currently relies on outdated or inappropriate proxies, including computer-based tasks or educational attainment (EDiT Consortium Handout, nd).

As noted above, some frameworks, such as UNESCO's Digital Literacy Global Framework⁷ (which builds on the European Commission's DigComp framework) establish minimum proficiency thresholds across competence areas, including information literacy, communication, content creation, safety, and problem-solving. Others like ITU's Digital Skills Toolkit (2024) articulate a three-level continuum — from basic skills (using hardware, software, and internet tasks such as emailing or filling forms), through intermediate skills (critically evaluating technology, creating content, and job-ready competencies such as digital marketing), to advanced skills

(ICT-specialist roles such as programming, data analysis, and network management).

However, both frameworks share a foundational limitation: they were designed around computer-based access in high-income country contexts, and were not developed with mobile-first populations, low-literacy users, or women in low-resource settings in mind, rendering them poorly suited as measurement tools for LMIC contexts.

Further, neither framework currently adequately captures the gradation of digital skills and AI-related competencies, nor do they address mobile-specific operational skills such as app installation, permission management, or digital financial transactions. Instead, in national surveys, skills are often measured through basic indicators such as the ability to make a call or send a text, which fail to capture whether women can apply digital tools to tasks that matter for livelihoods or service access.

This gap is particularly acute in India, where large-scale surveys do not test applied skills such as app installation, e-KYC, UPI payments, or privacy management.

There is also a growing consensus that skills measurement should shift towards mobile-relevant, applied capabilities that reflect how most users in developing contexts actually access and use digital services (Sharp, 2024).

(iii) On trust, safety, and norms:

The limitations are even more pronounced in domains where national surveys largely restrict measurement to generic reasons for non-use (for example, "privacy or security concerns" or "cultural reasons"), failing to capture women's lived experiences of online harassment, exposure to fraud, PIN and privacy management, fear-induced self-censorship, monitoring, social norms around online behaviors for women of different age-groups or social identities, or withdrawal from digital spaces.

Thus, existing surveys do not capture whether women can engage safely, confidently, freely, and meaningfully on digital platforms, whether they can genuinely control their access, or the extent to which they engage in high-impact use cases on their phones, patterns surfaced across qualitative and quantitative work in this portfolio (Apti; GxD Meghalaya; IIHS; UCT-Bihar Study).

⁷UNESCO. (2018). A global framework of reference on digital literacy skills for indicator

This leads to an overestimation of digital inclusion and an under-recognition of gendered digital constraints and harms.

The studies under this portfolio have made notable progress to correct these blind spots and limitations, specifically UCT's Digital Access and Use Index and other measurement guidelines, which conceptualize digital inclusion as multidimensional and relational, explicitly measuring skills, agency, trust, and norms alongside access.

3.5.2. Towards a Multidimensional Measurement Framework: Learnings From the Portfolio

A. Measuring Access Beyond the Binary

In an effort to reconceptualize measurement of digital inclusion beyond binary measures of phone ownership or reported use of the internet, the University of Cape Town and partners (under the Evidence for Digital Transformation (EDiT) consortium) have been working to improve measurement of digital access and use, including available metrics through a global level GE-DC investment and a companion India specific investment. This body of work has included efforts to achieve agreement on definitions and items associated with digital access – connectivity, affordability and physical access – and digital use including digital agency, safety, social and attitudes, digital skills, and use of phones for high impact use cases.

To develop survey modules, the EDiT consortium conducted scoping reviews, iterative stakeholder consultations and cognitive interviews in India, Kenya and Nigeria (2023-2024). The emerging bank of questions was then implemented in Bihar through a large (n=13,568) 10-district population-based digital access and use survey, which additionally sought to measure differences by gender and based on self-help group (SHG) membership status.

Findings (discussed in preceding sections) have provided important evidence on how to optimally measure key constructs including digital skills (observed vs. reported; with assistance vs. without), digital agency (decision-making, restrictions/constraints, permission), social gender norms and attitudes as well as safety.

Based on this survey, the EDiT consortium developed a [Digital Access and Use Index \(DAUI\)](#) (Evidence Digital, n.d.), which provides a comprehensive, but minimum set of questions across a range of digital access and use domains that can be used to re-imagine measurement of the digital gender gap and digital inclusion beyond the binary measures noted above. It is a composite, multi-dimensional framework designed to capture quality of access, including frequency, consistency, and functional connectivity in daily life, and embeds agency, decision-making, trust, and safety concerns as part of meaningful participation. In doing so, it aligns with the lived experiences of women in low-resource settings. Where prior indices, including the ITU's meaningful connectivity index, are challenging to measure at a country level and by individual programs, the questions underpinning the DAU can be easily integrated into any population-based survey (UCT-Bihar Study).

This index is accompanied by a [toolkit on measuring access](#) (UCT, 2024a), which contains a detailed set of survey items and measurement guidance focused on digital access, designed for LMIC contexts with varied levels of infrastructure and literacy. It includes operational definitions for device ownership, SIM control, and regular vs. occasional use, and encourages measurement of shared vs. personal access, barriers by context (household, community), and data affordability thresholds. This toolkit thus sharpens the measurement of access by asking who controls the device, when it is used, whether data costs limit use, and if women actually benefit from connectivity. Together, DAUI and the access toolkits reframe access as effective and meaningful, and correct the tendency of standard surveys to overstate women's digital access and inclusion.

Other studies in the portfolio also operationalized measurement of access by going beyond standard indicators and frameworks.

Drawing from emerging learnings from (UCT, 2024a), GxD's study in Meghalaya used a Digital Capability Index (DCI) that combined household-level and individual-level ownership and access with indicators on phone type, daily usage and time spent on phones, data spending and recharge decisions, proficiency on applied tasks (e.g., UPI and app use), and perceived safety and digital confidence.

By explicitly incorporating intra-household mediation and consistency of use, the framework captured the quality of access rather than just the presence of a device (GxD Meghalaya).

Other contextual and exploratory studies similarly addressed measurement challenges vis-a-vis access by separating nominal device access from functional capability or using multiple measures rather than ownership alone. IHS for example combined household-level smartphone presence, individual ownership status and primary user status, finding notable gaps between all three. The study further combined this with measures of ‘breadth of usage’ across multiple functional domains and aided versus independent use, to infer depth of access, rather than treating access as a binary state (IHS). Importantly, IHS’s survey also measured time-use on phones/periodicity of use and who women rely on for digital support.

Resham Sutra and Jagriti’s work distinguished between device access and functional competence by tracking task-based skills and composite capability scores, showing that ownership is a weak predictor of usable access when measured independently of skills and confidence (Resham Sutra; Jagriti).

Across the portfolio, the measurement evidence converges on a clear conclusion: access cannot be reliably measured through binary indicators. Instead, what is needed are composite, nuanced, and contextualized measures on quality of access and how access translates to use. Measurement approaches that disaggregate access into consistency, assistance, and task-based capabilities provide a more accurate and policy-relevant picture of women’s digital inclusion than ownership or self-reported use alone.

B. Measuring Skills, Capability, and Meaningful Engagement

As noted above, global and national surveys often rely on a small set of self-reported skills, do not differentiate between simple and advanced competencies, do not measure the ability to actually perform tasks with/without help, and include computer-based examples.

Several studies in the portfolio correct these blind spots by using task-based, mobile-first, and context-sensitive measures and capture specific use cases across livelihoods, education, and health.

For example, the UCT Study in Bihar divides measurement and analysis into basic skills (making phone calls, saving contacts, opening SMS, writing and sending SMS, audio prompts, and locking the phone) and advanced skills. Advanced digital skills are measured under 6 categories – financial transactions (mobile banking, used GPay/Paytm, purchased online, received OTP etc.), social media use (used, posted), e-governance (apply for govt scheme, call helpline), education (checked news online, searched internet, learnt to sell something etc.), safety and security (blocked someone on social media, changed online privacy setting etc.), internet connectivity, communication and collaboration (WhatsApp, sent a location pin, downloaded an app), and digital content creation (taken a photo/video). This suggests a clear emphasis on mobile-first contexts and everyday digital practices.

In the Bihar study, 14 out of 65 digital skills were identified for the Digital Access and Use Index, based on which a digital competency score for men and women was developed. The study also measured whether women are able to perform these skills on their own/independently or not.

Based on learnings from this study, UCT developed a [Measuring Digital Skills](#) (UCT, 2024b) in Low- and Middle-Income Countries toolkit, which offers task-based, graded skill measures. The toolkit reflects everyday digital tasks instead of abstract, context-unaware skills. This approach enables more accurate identification of where women’s skill gaps lie and supports programmatic decisions that binary or proxy measures cannot inform (UCT, 2024b).

Other studies operationalized meaningful engagement by distinguishing familiarity from functional capacity and independent use of specific digital functions. For example, GxD’s Meghalaya study focused on measuring WhatsApp messaging, app installation, QR-code payments, Wi-Fi connection, or privacy-setting changes, distinguishing between independent and assisted use to generate digital skills scores (GxD Meghalaya).

IHS applied a layered measurement approach that combined familiarity (awareness), platform-neutral skills (navigation, gestures), platform-specific tasks (e.g., WhatsApp, YouTube), and assisted vs independent performance to classify skill levels. Instead of treating usage frequency as evidence of engagement, the framework inferred confidence and capability from women's ability to navigate multiple functions independently (IHS).

Resham Sutra measured engagement through competency levels, tracking progression from simple to complex functions such as typing, managing contacts, using regional-language keyboards, and using social media for business. Crucially, Resham Sutra tracked a 'Dependence on Others' metric, finding that 13% of weavers remain entirely dependent on family members for phone use despite training (Resham Sutra).

The Afridi et al. (2025) study embedded digital and communication skills within vocational training and assessed outcomes such as employment status, earnings, and days worked (DP-WEE). By tying skill acquisition to observable economic behavior, this approach situated digital capacity within real-world application rather than treating platform interaction or exposure as sufficient evidence of engagement.

Across studies, we see three key shifts in terms of skills measurement:

- (i) a mobile-first and context-relevant list of skills, divided into basic and advanced levels,
- (ii) focus on everyday use cases and purpose of skills (e.g., using apps to sell products/for livelihood), and
- (iii) measurement of women's assisted versus independent use.

In doing so, the studies move beyond awareness or exposure alone to capture whether women can apply digital capacities across tasks, contexts, and decisions without reliance on others.

The evidence synthesis suggests that indicators of skill depth, independence, progression, and real-world application offer a more informative lens on meaningful digital engagement than access or reported use alone.

However, important methodological gaps remain, particularly in relation to discrepancies between self-reported and observed digital skills, and the measurement of AI-related capabilities and readiness.

C. Measurement Learnings Around Trust

Within the GE-DC portfolio, trust is treated as a measurable dimension of digital engagement and not as an outcome or enabling condition alone. The reviewed studies capture trust through how people assess risk, respond to uncertainty, and take protective or cautious actions when using digital tools.

Aapti's qualitative work contributes most directly to measuring trust as a construct. Using participatory and human-centered design (HCD) tools, specifically persona-based scenarios, social relations mapping, and risk-benefit exercises, the study elicits how users evaluate risk, value, and reliability in digital systems. Measurement focuses on comfort thresholds, social influences, how women interpret specific situations, including trust breakdowns, and how they decide whether to proceed, modify behavior, or disengage. This is done using icon-recognition exercises, vulnerability mapping, and participatory vignettes. Trust is therefore recorded as a conscious decision made within a given context, a socio-psychological construct, shaped by experience and perceived consequences (Aapti).

Quantitative surveys like UCT's Bihar study measured safety and security through concrete behaviors and security tasks. These include measures such as data protection, privacy practices (changing settings), blocking practices (contacts and on social media), and experiences with fraud.

By focusing on observable behaviors such as privacy settings (e.g., in the Bihar study, only 5% of women had changed privacy settings compared to 19% of men), the survey records perceived safety and risk awareness without relying solely on attitudinal questions (UCT-Bihar Study). Key dimensions of safety and security are also included in UCT's Digital Access and Use Index, recognizing their critical role in shaping overall meaningful access and use.

Other surveys, like the GxD hub's Meghalaya study, also focused on both risk awareness (knowledge of scams and fraud) and perceived safety (how secure a user feels) and integrated it into their indices to capture how harms and perceived risk shape capability (GxD Meghalaya).

UCT's accompanying toolkit on [Measuring Digital Harms](#) (UCT, 2025) provides quantitative modules to capture experiences of harm, perceived and actual safety, coping strategies, self-censorship, and social surveillance. In doing so, UCT complements the critical work done by partners like Aapti by operationalizing trust and safety as measurable constructs (UCT, 2025).

Across these studies, trust is not inferred from how often women use digital tools or which platforms they access. Instead, it is measured through structured responses to risk, safety-related behaviors, and perceptions of vulnerability. These approaches allow trust to be documented in ways that are observable and comparable, while remaining distinct from access, skills, or engagement outcomes.

3.5.3. Methodological and Research Design Learnings

A. Sampling strategies to allow for disaggregation and subgroup analysis

While cross-country comparisons are common, existing evidence suggests that far less attention is paid to inequalities within countries, and disaggregated data by gender, geography, and household context remain limited in many settings (Sharp, 2024). Studies need to develop sampling strategies that allow for robust subgroup analysis, as smartphone ownership, meaningful access, and use vary not just by gender, but also by age group, marital status, geography, social identity, economic deprivation levels, occupation, and so on, as revealed in some of the studies discussed above.

Across the GE-DC portfolio, research designs incorporate multiple forms of disaggregation to move beyond headline gender comparisons. Rather than treating women as a homogeneous category,

these design choices enable analysis of how digital access and use vary across rural and urban contexts, different household arrangements, and degrees of control and mediation over devices. This emphasis responds to a broader gap in digital inclusion measurement. Large population-based surveys such as UCT's Bihar study and the GxD Meghalaya study disaggregate outcomes by gender alongside geography, phone ownership status, type of device, and sharing arrangements. In both studies, disaggregation by ownership and sharing status is particularly important for revealing gaps between nominal access and effective use that remain obscured in aggregate gender comparisons (UCT-Bihar Study; GxD Meghalaya).

Several studies also incorporate programmatic, occupational, or group-level identifiers to situate digital capabilities within economic and social contexts. IIHS differentiates respondents by employment type (e.g., domestic workers, street vendors) and engagement with worker collectives, allowing analysis of how institutional support shapes digital capability (IIHS). Resham Sutra and Jagriti distinguish participants by training cohort and intervention exposure, enabling assessment of how structured skilling inputs influence digital competencies, confidence, and retention over time (Resham Sutra; Jagriti). The DP-WEE evaluation further embeds digital measures within a vocational training context, linking skill acquisition to labor-market participation, days worked, and earnings (Afridi et al., 2025).

These designs allow for a granular analysis where digital outcomes are examined in relation to the specific social and economic environments women inhabit. This emphasis on disaggregation responds to a broader gap in digital inclusion measurement. Existing evidence highlights that while cross-country comparisons are common, far less attention is paid to inequalities within countries.

B. Role of Qualitative and Exploratory Methods

Participatory tools, in-depth interviews, and task-based exercises can reveal actual capabilities, decision processes, and social or technical constraints that structured surveys miss. Studies in this portfolio combined surveys with task performance and qualitative interviews (IIHS, Resham Sutra, GxD Meghalaya) to understand the role of mediators and gatekeepers, identify functional competencies and technical barriers to usage, and patterns around autonomy and perceived safety. These insights helped contextualize survey results and generated insights on hard-to-measure aspects like autonomy and norms. Aapti used human-centered design methods to develop the trust ontology and user personas (Aapti).

The EDiT Consortium’s work on cognitive interviewing methodology demonstrates how to adapt survey language and question sequencing for different settings (e.g., India and South Africa) (Evidence Digital, n.d.). This emphasis on cognitive pre-testing and adaptation is important because standard global surveys often transplant question wording without confirming how respondents interpret terms like “internet use,” “smartphone,” or “data cost”, which leads to measurement errors.

These methods and lessons in survey adaptation and contextualization provide important inputs into measurement design and interpretation across the portfolio. Insights from qualitative and exploratory work inform how survey questions are framed, how response categories are interpreted, and which dimensions of digital inclusion, such as autonomy, assistance, safety, or relevance, require more precise or context-sensitive measurement (Aapti; IIHS; Resham Sutra; GxD Meghalaya; UCT-Bihar Study). **Qualitative evidence strengthens the validity of survey-based findings by clarifying what reported responses mean in practice and by identifying blind spots that structured instruments may otherwise miss.**

C. Role of Indices and Composite Measures

To move beyond single-variable analysis, studies across the GE-DC portfolio employ indices that organize multiple indicators into coherent measurement frameworks. While large-scale surveys like UCT and GxD Meghalaya utilize comprehensive frameworks, such as the Digital Access and Use (DAU) and Digital Capability Index (DCI) to aggregate connectivity, proficiency, and safety into unified population-level scores, other studies develop specialized composite measures tailored to specific segments (UCT-Bihar Study; GxD Meghalaya).

Resham Sutra’s research for example constructed graded competency tiers based on demonstrated task performance, tracking progression from basic phone usage to complex business functions. Jagriti employed a composite Knowledge–Skills–Attitude (KSA) score alongside a digital literacy score, allowing for the monitoring of not just skill acquisition but also attitudinal shifts and long-term retention among rural entrepreneurs (Jagriti). Expanding the focus to functional application, the DP-WEE study linked composite digital and communication skill scores directly to labor market outcomes (Afridi et al., 2025). Karya used task-based performance metrics, specifically the ability to successfully navigate virtual training interfaces and complete annotation tasks as a functional proxy for digital access, measuring inclusion through the lens of workforce readiness and confidence (Karya). IIHS’s survey complements these measures by inferring depth of access through a ‘Breadth of Usage’ metric, which counts distinct functional domains (IIHS).

Across these approaches, indices are not treated as substitutes for underlying indicators but are used alongside them. This enables a diagnostic analysis that can isolate specific drivers of exclusion, whether they are technical (task failure in Karya), social (dependence in Resham Sutra), or structural (breadth of use in IIHS) while still supporting high-level comparisons. Presenting component measures alongside summary indices improves interpretability and supports more targeted policy and programmatic responses (Sharp, 2024).

Emerging Directions

Translating insights into program design, technology development, measurement approaches, and AI-enabled systems

04



4.1. Implications for Program Design and Technology-driven Interventions



Women must not be excluded from the benefits of the AI transition, and existing gaps in digital inclusion must not be reinforced or widened.



As India shifts from establishing foundational digital public infrastructure to integrating AI into governance and service delivery, ecosystem actors across sectors are embedding AI into existing systems and workflows. At this stage, it is critical to ensure that women are not excluded from the benefits of this transition, and that existing gaps in digital inclusion are not reinforced or widened. Welfare and development programs and AI-driven digital solutions must be informed by evidence from


recent learning efforts and address the barriers that shape women's digital access, use, and outcomes.

Digital inclusion strategies and programs also must adopt an intersectional lens, accounting for how deprivation, literacy, life stage, and social identity mediate each access, affordability, skills, and trust, and shape women's overall digital trajectories. Without such an integrated and socio-economically grounded approach, efforts risk addressing one constraint in isolation while leaving structural barriers intact.

The table below summarizes key findings from this evidence review and translates them into actionable implications for program design and AI-enabled or digital solutions.

Domain	Key findings	Implications for program design & AI-driven or digital solutions
Access 	Smartphones are commonly shared within households, including those owned by women; women's use is often secondary and intermittent. Phones are prioritized for men's work or children's education (Aapti; UCT-Bihar Study; GxD; IIHS).	Design programs and AI/digital solutions assuming shared, negotiated, and time-bound access. Explicitly plan for competing household claims on devices with multi-user functionality, privacy guardrails, and avoid assuming exclusive access for women as individual users.
	Women's time use on phones is compressed into short windows (1–3 hours/day), often at specific times, with limited privacy and supervision (Aapti; Afridi et al., 2025; UCT-Bihar Study; GxD, IIHS).	Structure engagement, learning modules, and interactions for short, modular use, low cognitive load, and minimal reliance on prolonged or uninterrupted sessions.
Affordability and Financial Agency 	Device affordability & household deprivation levels shape access to phone type and quality (feature phones, low-capacity smartphones); limited storage on shared phones leads to frequent app deletion (Aapti; IIHS; GxD).	Prioritize lite, low-storage, low-processing solutions; avoid heavy apps or high-spec requirements that exclude women with lower-end devices. Design with minimal storage footprint.
	Data costs & irregular connectivity: Ongoing data costs constrain use; women frequently ration data or rely on others' hotspots (GxD; Aapti; IIHS). Patchy connectivity and uncertainty about errors undermine trust (GxD; Aapti).	Build solutions that are low-data, offline-tolerant, or usable over intermittent connectivity; minimize background data consumption. Simultaneously, integrate strategies that strengthen women's financial agency over devices and data, rather than focusing only on handset provision.

Domain	Key findings	Implications for program design & AI-driven or digital solutions
<p data-bbox="193 344 296 378">Skilling</p> 	<p data-bbox="440 344 887 434">Low rates of independent app downloads; reliance on male relatives for security and settings (GxD; Aapti)</p> <p data-bbox="440 488 887 667">While women exhibited basic digital skills (calling, texting), a gender gap exists in intermediate skills (digital payments, downloading apps, searching internet) (GxD Meghalaya; UCT- Bihar Study)</p> <p data-bbox="440 689 887 831">Program Design Gaps: Skilling programs often fail by using a "one-size-fits-all approach," which can exclude women with different levels of confidence, skills, and agency. (Quicksand)</p> <p data-bbox="440 860 887 1032">Lack of contextualized content, which is not aligned with the cultural/social contexts of rural India, making the tool unusable (Karya); challenges with English-language keyboards (Quicksand)</p> <p data-bbox="440 1061 887 1173">When digital trainings are linked with direct economic use cases or layered onto vocational training, adoption improves (DP-WEE; Jagriti)</p>	<p data-bbox="903 344 1388 456">Simplify onboarding, reduce security complexity, and minimize steps requiring technical confidence or third-party mediation.</p> <p data-bbox="903 488 1388 636">Segment users by skill levels (foundational - intermediate - advanced). Provide graded learning pathways. Embed digital skills within practical use cases rather than standalone modules.</p> <p data-bbox="903 658 1388 808">Design principles for gender-intentional skilling, including learner segmentation, contextualized use cases, women trainers, and post-training support, offer actionable pathways to address these gaps (Quicksand)</p> <p data-bbox="903 860 1388 1003">Integrate multilingual and voice-based functionality to overcome literacy and design barriers. Prioritize voice-led learning, app features, regional-language content, and WhatsApp-based guidance.</p> <p data-bbox="903 1061 1388 1205">Link skills to tangible value: Integrate digital and vocational training to maximize uptake and embed digital skills training in use cases tied to economic benefits such as income and access to entitlements.</p> <p data-bbox="903 1227 1388 1429">Embed practical, outcome-oriented learning that improves livelihoods, productivity, and access to services with existing work or learning routines, such as business tracking, cooperative bookkeeping, or accessing entitlements, to turn training into a functional asset.</p>
<p data-bbox="193 1449 328 1518">Trust and Norms</p> 	<p data-bbox="440 1449 887 1538">Gendered norms, supervision, and fear of scrutiny limit exploration and experimentation (IHHS; Aapti).</p> <p data-bbox="440 1592 887 1861">Four core personas are seen among women with some degree of digital access—the Native (risk-informed), Learner (risk-indulgent), Anxious (risk-averse), and Naysayer (risk-minimalist)—highlighting variation in digital willingness and digital capacity and offering a predictive lens to tailor trust-building (Aapti).</p> <p data-bbox="440 1883 887 2018"><20% women know how to block someone on social media or change privacy settings, even though several women reported receiving spam calls or false claims.</p>	<p data-bbox="903 1449 1388 1570">Test safety- and privacy-by-design features (e.g. multi-user logins, disappearing OTPs, discreet interfaces) suitable for shared-device contexts.</p> <p data-bbox="903 1592 1388 1682">Tailor communication, onboarding, and grievance mechanisms to user trust profiles and journeys.</p> <p data-bbox="903 1883 1388 1995">Integrate digital safety modules into mainstream digital and AI programs. Simplify privacy controls and offer periodic nudges and safety refreshers in local languages.</p>

Domain	Key findings	Implications for program design & AI-driven or digital solutions
	<p>Women need safe spaces to experiment and fail, as trust-building is an ongoing process (Aapti).</p> <p>Community intermediaries play an important role in digital trust (IHHS; Aapti).</p>	<p>Strengthen digital capacities of intermediaries. Train female peer mentors and SHG federations as digital facilitators. Design programs to leverage community mediators.</p> <p>Identify female trainers/peers and digital champions from the community.</p> <p>Create safe spaces for experimentation and learning practical skills, by leveraging community mediators/leaders or peer networks (SHGs), and providing continuous support.</p>

4.2. Implications for Measurement and Metrics

As we saw in Section 3.5, current global and national metrics on digital inclusion are inadequate. The investments under this portfolio, specifically UCT's toolkits, systematically address those blind spots by introducing nuanced, contextualized measures on meaningful digital access and use, digital harms and trust, and mobile-relevant, task-based, graded digital skills, suitable for LMIC contexts. To move beyond single-variable analysis, studies, specifically those by UCT and GxD, employ indices that account for how different indicators intersect to shape digital inclusion. Studies have also focused on measuring everyday use cases and how skills translate to productivity or livelihood outcomes, women's assisted vs independent use, the role of intermediaries, and how intra-household power dynamics shape digital access. Participatory and in-depth, human-centered research, such as that conducted by Aapti, has complemented these efforts and surfaced important methodological learnings and the value of qualitative research in unpacking patterns around autonomy, decision-making, and social norms.

Thus, substantial progress has been made in moving beyond binary indicators such as device ownership to examine who uses devices, how often, for how long, and for what purposes. However, indicators, toolkits, indices, and methodologies developed through these studies require wider socialization and uptake across programs and evaluations to enable comparability and learning at scale.

(i) Dissemination and uptake of contextualized metrics:

There is a need to invest in ecosystem sensitization across national statistical agencies, implementers, donors, and practitioners to adopt the measurement concepts and metrics that have emerged through this portfolio. Embedding validated and contextualized indicators such as those developed by UCT into national and global surveys (such as GSMA's Mobile Gender Gap survey, the Comprehensive Modular Survey-Telecom (CMS:T and NFHS) would allow for consistent cross-country comparability and more accurate tracking of digital inclusion.

(ii) Use evidence to design and adapt programs:

Increasingly, digital or AI tools are being layered into social development programs across education, livelihoods, health, agriculture, and so on. Such programs should use these contextualized digital inclusion metrics to

(a) measure baseline conditions of shared access, level of skills, role of intermediaries, to inform program design,

(b) tailor training or intervention pathways for different segments based on access quality, skill level, digital trust persona, etc., and

(c) track progress over time.

Exploratory and evaluation studies should also layer **qualitative techniques** such as digital diaries, scenario-based vignettes, and participatory mapping to capture emotional and relational dimensions of access, barriers, and social norms. These can reveal contextual barriers that quantitative instruments cannot surface.

(iii) Intersectional disaggregation must become routine so that differences by socio-economic status, geography, or literacy are not overlooked. We need more research on how digital access, affordability, use, and agency evolve across generations and life stages, and intersect with economic deprivation, social identity, and geography. This is because digital interventions rarely reach an individual woman in isolation but operate within family and community networks where access, control, and confidence are continuously negotiated. Strengthening evidence along these dimensions is critical to designing interventions that reach those most structurally excluded from meaningful digital participation.

(iv) Measure AI-readiness: Programs should also begin testing AI-readiness indicators that record women's ability to navigate voice assistants, interpret consent requests, and detect misinformation. As India's digital public infrastructure increasingly integrates AI, women's readiness to engage with these systems remains largely unknown. Current research offers little insight into how low-literacy or older users interpret consent prompts, manage data sharing, or respond to algorithmic recommendations in health and finance.

Studies should explore how women can safely and confidently interact with AI-enabled systems through voice-first tools, transparent consent processes, and localized mediation, ensuring that the next layer of digital transformation does not reproduce existing inequities.

Addressing these evidence gaps is essential for building equitable digital inclusion strategies that factor in life stages. Research that captures these complexities can inform adaptive and inclusive design models. Most findings already point to the potential of multigenerational and collective learning models, but these remain under-tested. Understanding these dynamics can help move digital inclusion from merely expanding connectivity to redistributing digital power within households and communities.



From Digital Connectivity to AI Inclusion: Advancing the Gender Equality Agenda

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The synthesis affirms that digital inclusion for women must evolve from a focus on access to safe, autonomous, and meaningful engagement. The momentum created by foundational studies demonstrates that when inclusion strategies align with lived realities and needs, digital transformation can become a pathway to dignity and self-determination. The task ahead is to build an ecosystem where digital participation expands women's choices, strengthens collective voice, and reshapes norms of inclusion for the digital decade ahead.

As the GE-DC learning agenda concludes, giving way to the next wave of strategic programming and learning priorities around AI readiness, adaptation, and adoption, learnings from this portfolio can inform how AI tools are developed, deployed, tested, and scaled up. **In particular, the nuances around the scale and characteristics of the gender digital divide synthesized in this evidence review underscore that the next-wave learning agenda should move beyond questions of access to examine how women meaningfully, safely, and independently adopt and shape AI tools within shared, resource-constrained, and socially negotiated digital environments. This requires closer attention to the contexts for which AI-based solutions are being designed and deployed.** For example, research should now focus on how AI operates on shared, low-capacity devices or in intermittent connectivity contexts; assess the effectiveness and risks of voice-first, multilingual, and low-literacy and offline interfaces; and identify

the specific intermediate digital and AI skills women need to interpret AI outputs, question results (ensuring epistemic friction), and reduce reliance on mediation by gatekeepers or male household members. The DPI-AI convergence also raises critical questions around trust, safety, and inclusion, and it is critical that AI systems layered on DPIs are designed responsibly and with institutional safeguards. More evidence is needed on gendered AI harms (ranging from physical to economic harms through fraud or misinformation) and whether safety-by-design features genuinely mitigate these risks.

Another critical area of research is to examine whether AI-enabled use cases and digital solutions translate into real economic gains and bargaining power for women, particularly where control over data, devices, and finances is limited. The role of community intermediaries and frontline workers/service providers also warrants further examination, both for their potential to contextualize and support AI and digital adoption, and for the risk of reinforcing dependency. Finally, future learning efforts should invest in contextualized metrics of AI readiness and scale that focus on women's agency, privacy, confidence, and control over purely technical indicators, ensuring that AI expansion does not reproduce or deepen existing gender inequalities.

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Annexure 1: Summary of GE-DC Portfolio Investments (2022-2025)

Snapshot of GE-DC Research/Program Portfolio						
Partner	Primary Learning Focus	Additional Themes	Methods	Locations	Respondent Profile	Sample Size
Exploratory and Landscape Studies						
Apti Institute	Understanding barriers, limiters, enablers and drivers of digital trust among women and men in four states	Trust & Risk; Access & Ownership; Norms & Agency, Digital Use and Capability	Literature review, qualitative research using human-centered design (HCD) activities, and analysis of PRIA field data (Participatory vulnerability analysis (PVA))	Jharkhand, Maharashtra, Odisha, Uttar Pradesh (Urban & Rural)	Urban and rural women/men; low- to middle-income households; mix of homemakers, informal workers, SHG members	Participatory vulnerability analysis/ Focus Group Discussion: 332 women, 217 girls, 178 men, 80 boys; HCD: 72 persona validation interviews; 91 in-depth interactions
IIHS	Understanding women informal workers' platform use and the role of community mediators in building agency, trust and gender-intentional design for digital public infrastructure	Livelihoods and Outcomes; Trust & Risk (Mediators); Use and Capability; Norms and Agency	Survey (purposive sampling); FGDs and IDIs	Delhi, Jaipur, Hosur, Anekal, Puducherry (Urban)	Urban low-income women; domestic workers, tailors, vendors; many migrant households;	719 surveys; 31 In-depth Interviews; 30 Focus Group Discussion (FGD)
Karya	Exploring gender bias in Hindi digital data and developing community-centered methods for identifying and generating gender-biased statements	Data & Bias; Bias audits, Norms & Agency	Digital data analysis; IDIs; workshops	Kannauj, Lucknow – UP (Rural–peri-urban)	Hindi-speaking women and transgender persons; community workers;	14 women in Case Study 1: Gender Bias Awareness Workshop – Lucknow, Uttar Pradesh; -15 women in Case Study 2: Annotation Study – Kannauj, Uttar Pradesh

Snapshot of GE-DC Research/Program Portfolio

Partner	Primary Learning Focus	Additional Themes	Methods	Locations	Respondent Profile	Sample Size
Quicksand	Assessing gender intentionality in digital skilling programs through a gender audit of strategy, pedagogy, content, and implementation, and developing actionable design principles to support gender-intentional program design	Pedagogy & Program Design; Norms & Agency	Gender analysis; landscape mapping; KIIs; expert consults; program; journey mapping	Partner program geographies: - Digital Sakhi: Rajasthan - NASSCOM: Tamil Nadu, Karnataka, Maharashtra - Digital Green: Bihar, Jharkhand, Odisha, Telangana, Andhra Pradesh GSMA-MISST: Pan India	Program personnel and ecosystem partners	3 digital skilling programs (a community-based digital literacy program delivered through women SHG networks, an AI-powered agricultural extension platform reaching women farmers, and a women's entrepreneurship and digital skilling program linked to non-traditional livelihood models);
Large Scale Surveys						
GxD hub (LEAD/IFMR)	Examining how socio-economic context shapes digital access, capability and gender gaps, and how user personas can inform gender-intentional digital inclusion pathways	Access and Ownership; Use and Capability; Norms and Agency; Measurement	Quantitative Household and individual surveys; FGDs and IDIs	Meghalaya (Multi-dimensional Poverty Index (MPI)-based district sampling; rural focus)	Men & women aged 15–59 years; mix of farmers, wage workers, students	1,717 Households; 3,207 individuals (1,692 Women / 1,515 Men)
University of Cape Town	Measuring population-level digital access and use in Bihar and examining how SHG membership shapes women's digital journeys	Contextualized metrics on Access and Ownership; Use and Capability; Norms and Agency	Individual-level surveys and cognitive testing	Bihar – 10 districts (Mostly rural)	Men & women aged 18–60; SHG & non-SHG; agrarian and informal workers	13,568 respondents (approximately 7000 households; 8567 women/ 5,001 men)

Snapshot of GE-DC Research/Program Portfolio						
Partner	Primary Learning Focus	Additional Themes	Methods	Locations	Respondent Profile	Sample Size
Intervention Pilots or Experiments						
DP-WEE Program – LEAD/CECFEE at ISI	RCT to test vocational training (VT) vs vocational and digital training (VTP) models on women's employment, income and digital use	Livelihood Outcomes; Use & Capability	RCT 3-arm; baseline–endline	Bangalore & Delhi NCR (Urban/peri-urban)	Women 18–40 years; SC/ST & OBC majority	1,956 total (742 VT; 739 VTP; 475 Control)
Jagriti	Program learning on whether digital literacy and entrepreneurship training can build women's capability, employability and micro-enterprise pathways	Pedagogy and Program Design; Livelihoods & Outcomes	Surveys and FGDs	UP: Deoria, Kushinagar, Gorakhpur (Rural–peri-urban)	Adolescent girls and women; students and micro-entrepreneurs; low-income households	Cross-sectional survey: 5,509 respondents; 70 FGDs; Program training data: 1,087 digital literacy, 591 micro-entrepreneurship, 54 new business models (not a baseline–endline design).
Resham Sutra	Understanding women weavers' livelihoods, market access and digital capability to inform digital literacy interventions	Access & Ownership; Use & Capability; Livelihoods	Mixed-methods baseline–endline evaluation (structured surveys, FGDs, trainer observations)	Assam, Chhattisgarh, Meghalaya (Rural)	Women & male silk weavers; low-income artisan households;	Baseline survey: 662 women weavers; of which 375 weavers were part of Digital Literacy Training; Endline survey: 66 weavers (10% of baseline).

Note: In this report, findings from published and unpublished reports shared by these partners are referenced consistently with the organization name in parentheses. Where available, links to published reports are added in the reference list.





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