MAKING DIGITAL PUBLIC INFRASTRUCTURE WORK FOR WOMEN AND GIRLS: EXEMPLAR STORIES

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Making Digital Public Infrastructure Work for Women and Girls: Exemplar Stories

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EXECUTIVE SUMMARY

This report highlights insights from early efforts to make digital public infrastructure (DPI) gender-inclusive.

According to Co-Develop, DPI involves society-wide, digital capabilities that are essential to participation in society and markets as a citizen, entrepreneur, and consumer in a digital era. Core DPI elements include digital identity, digital payment and data exchange systems that enable broad access to essential services. (Section 1 of this report introduces core concepts and examples of DPI.)

DPI is not gender neutral. The way DPI is designed and operated shapes who can access essential public services, exercise rights and participate fully in a digital era. While DPI is enabling broader access and inclusion, efforts to design DPI with and by women and girls remain limited.

This gap matters. Global progress on gender equality is off track, with no gender-related target or subtarget for the Sustainable Development Goals (SDGs) expected to be met by 2030 (UN Women, 2025). Barriers continue to limit access to public services, markets and opportunities throughout women's lives, undermining their well-being and agency and constraining broader social and economic development.

DPI can help close these gaps but only if it is built to serve everyone. This requires a nuanced understanding of the needs and interests of different groups, including women and girls. Poorly designed systems risk reinforcing discrimination, compromising personal privacy and security. If DPI is not designed and built as an enabler, it risks becoming another barrier to essential services and equal rights (see section 1).

At a minimum, gender-inclusive DPI should:

- Be designed and implemented through multistakeholder governance arrangements centred on community engagement that includes the contributions of women and girls
- Address key challenges women and girls face in accessing and using services in a safe and secure manner
- Enable the regular collection and sharing of gender-disaggregated data to measure differential impacts.

This report presents exemplar stories and lessons from digital services worldwide. It seeks to demonstrate the value of gender-inclusive DPI and its potential to accelerate progress towards the SDGs (see sections 2 and 3). It builds on the DPI Safeguards Framework, which outlines risks to safety (privacy vulnerability, digital and physical insecurity, and lack of recourse) and inclusion (discrimination, unequal access, exclusion and disempowerment).

Finally, it proposes recommendations to support and scale up efforts to build gender-inclusive DPI (see a summary of recommendations below, as well as section 4). Leading up to 2030, work will continue to co-create guidance on gender-inclusive DPI governance, engagement and design, as well as more systematic data collection and publication. The authors invite governments, regulators, civil society, donors and technology providers to join this effort.

Towards Gender Inclusive DPI

A DPI approach can improve access to services, opportunities and remedies as well as support agency, safety and empowerment for women and girls.

Recommendation 1

Invest at scale in gender-inclusive DPI to address challenges faced by women and girls.

Recommendation 2

Design and build DPI with and by women and girls from the start, and include their perspectives throughout the cycle of design, development, deployment, reflection and review.

Recommendation 3

Collect gender-disaggregated data on the impact of DPI for all genders, including outcomes related to awareness, access and use.

VISIONS

Laws and regulations that safeguard rights	Data governance and data protection measures	Inclusive DPI governance arrangements where women have meaningful participation in decision making	Engagement with women and girls and CSOs to hear diverse voices on needs, preferences, experiences	Gender Disaggregated data is collected, analysed and integrated in monitoring and impact evaluation	Women included at all levels of ICT Industry – STEM education, mentoring and networking supported

ACTIONS

Design interfaces that are intuitive and work for women and girls with less digital literacy	Ensure digital and non-digital ways for women and girls to engage with services	Effective grievance systems	Do No Harm, Safety and Privacy by Design	Meets disability-inclusive design standards	Safe spaces for women to build digital skills and literacy

1. INTRODUCTION: DIGITAL PUBLIC INFRASTRUCTURE AND GENDER INCLUSION

Digital public infrastructure (DPI) is increasingly widespread, enabling financial inclusion and access to essential services[1]. Efforts to harness it to advance progress on Sustainable Development Goal (SDG) 5 on gender equality, however, remain in early stages. Recognizing this gap, this report highlights efforts to develop gender-inclusive DPI that can be replicated and scaled up.

DPI IS EXPANDING ACCESS TO ESSENTIAL SERVICES AND OPPORTUNITIES

DPI involves "society-wide, digital capabilities that are essential to participation in society and markets as a citizen, entrepreneur, and consumer in a digital era" (Eaves and Sandman, 2023). As recognized in the Global Digital Compact, DPI has "the potential to deliver public services at scale and increase social and economic opportunities for all". India's Aadhaar, Brazil's Pix and Estonia's X-Road systems are commonly cited examples of DPI delivering the core functions of identification, payments and data exchange, respectively.

As of 2025, countries operated 64 digital identity systems with at least two sectoral use cases, 97 digital payments systems with a public interest operator and 103 data exchange systems (see The Digital Public Infrastructure Map). Many more DPI use cases are in development. The map shows the extent of digital ID systems that are operational or in development worldwide. DPI development builds on previous waves of development and digitization (see the appendix for a timeline).

DPI aims to replace isolated end-to-end (and often proprietary) solutions with interoperable ones. Increasingly, it leverages modular, reusable building blocks to enable rapid, cost-effective digitization of a wide range of programmes and services at scale. This can include the use of digital public goods (DPGs); the figure below explains how DPI and DPGs can work together[2]. The value of this approach is being recognized internationally. For example, the Global Digital Compact positions DPGs and DPI as key drivers of inclusive digital transformation and innovation. The majority of exemplar stories in this report involve building DPI with DPGs (see section 2).

1. For the extent of DPI deployments, see The Digital Public Infrastructure Map. For a summary of evidence on the role of DPI in financial inclusion, see Co-Develop and DIAL, 2024.

2. DPGs are open-source software, open standards, open data, open artificial intelligence systems, and open content collections that adhere to privacy and other applicable laws and best practices, do no harm and help attain the SDGs. A stack of DPGs that are interoperable and scalable can come together to build DPI in countries (for more, see the Centre for Digital Public Infrastructure).

GENDER-INCLUSIVE DESIGN IS CRITICAL FOR DPI TO REACH A SOCIETAL SCALE

For DPI to enable society-wide capabilities and access to essential services, it must respond to everyone's needs, including those of women and girls.

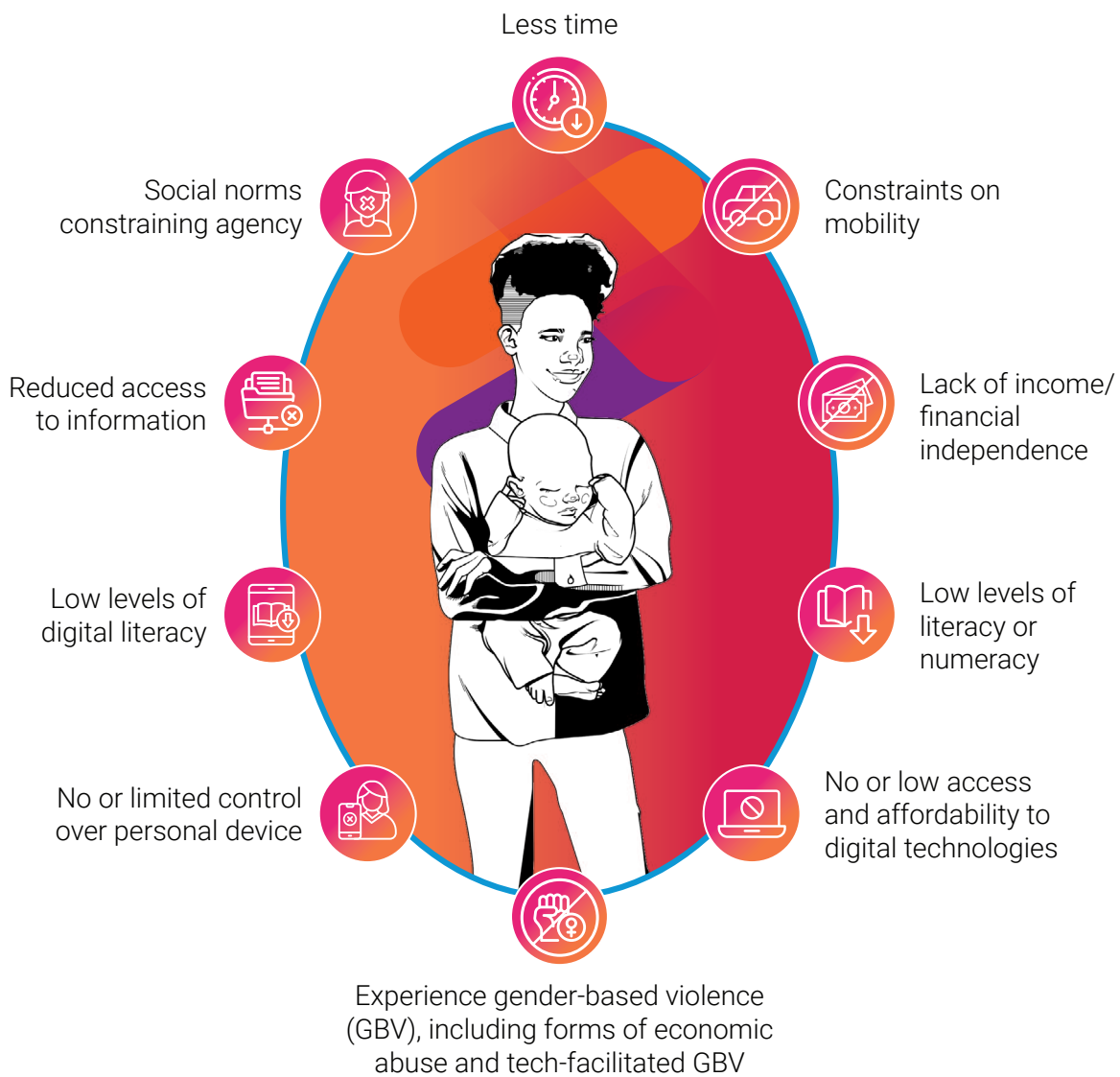
This requires understanding and responding to existing obstacles faced by women and girls. Women confront a range of distinct challenges in accessing services, markets and opportunities. These may be related to accessing financial resources, education, technology, information, health or mobility. Additionally, barriers arise depending on where women live (e.g., a rural or urban area), their experience of gender-based violence, their level of digital literacy, as well as prevailing social norms (particularly those that limit agency). These barriers can intersect and compound different levels of disadvantage.

Globally, as of 2024, 20 million more women lived in extreme poverty and 70 million more experienced moderate to severe food insecurity compared to men. Women are more likely to suffer from chronic health conditions than men. As of 2021, women spent, on average, 10.9 years in poor health over their lives compared to 8 years for men (UN Women and UNDESA, 2025). More than 1 in every 8 women aged 15–49 was subjected to physical and/or sexual violence by a current or former intimate partner in the previous 12 months globally (ibid.). Nearly 1 in every 5 young women aged 20–24 or 18.6 per cent was first married or in a union before age 18, down from 22 per cent in 2014 (ibid.). Women and girls make up the majority of victims of trafficking in persons identified globally (UNODC, 2024).

Women are more likely than men to face barriers to accessing mobile phones and the Internet. They are 9 percentage points less likely than men to own a mobile phone in low- and middle-income countries, with even greater differences in South Asia (Klapper, Singer, Starita et al., 2025). Globally, 70 per cent of men use the Internet compared to 65 per cent of women (UN Women and UNDESA, 2025). There is some evidence that this gender gap is increasing in the least developed countries (ITU, 2024)

Globally, no target or subtarget associated with SDG 5 is on track to be met by 2030 (UN Women and UNDESA, 2025). Monitoring gender gaps comes with constraints, however. In 2024, only 26 per cent of 121 countries and areas had comprehensive systems to track resource allocations for gender equality, unchanged from 2021 (ibid.). This challenge may increase; more than half of national statistics offices reported funding cuts in 2025 (ibid.).

Challenges faced by some women and girls in accessing services and opportunities



DPI can and should be a means to make progress in addressing these challenges. But it will do so only if designed and implemented to serve all people equitably and protect their rights. For example, Aadhaar has helped extend basic social and financial services to hundreds of millions of new beneficiaries (Co-Develop and DIAL, 2024). Better support for marginalized and vulnerable communities to use it would require a more gender-inclusive approach to governance and delivery.

This exposes a potentially uneasy truth. Like most service delivery mechanisms, DPI is not gender neutral. Gender inclusion is therefore a critical consideration in its design and operation. Yet this is not the norm. Only a fraction of DPI implementation examples in the DPI Use Case Explorer gather gender-disaggregated data or incorporate gender equity as a design principle. If DPI is not carefully designed to respond to gender gaps, it may reinforce or entrench them.

When considering DPI approaches, it is important to keep in mind that a woman or girl will continue to access services, information, remedies and markets in ways that work best for her, through digital and non-digital channels. This could comprise face-to-face interactions with trusted front-line services, radio shows, podcasts, social media apps, phone calls or website portals. The Centre for Digital Public Infrastructure emphasizes that "well designed DPI caters equally to people with and without connectivity, and with and without smartphones". Only DPI designed and implemented to overcome the challenges that women face is likely to close, rather than widen, the digital divide.

DESIGNING FOR LIFE CYCLES ENABLES GENDER-INCLUSIVE DPI

It is critical to design DPI for diverse women and girls, considering differences and adjustments for women as distinct from girls and adolescents, and the further challenges women and girls may face when:

- Living in urban, rural and remote areas
- Living with a disability
- Living in camps for refugees or internally displaced persons
- Migrating for work

DPI design must recognize women's experiences across the entire life cycle, from birth registration to support in older years. Governments, regulators, donors, technology providers and civil society advocates need to proactively consider the life cycle, and how the key components of digital ID, payment and data exchange systems can deliver real benefits, safely and equitably, at every stage.

Interoperable DPI can help document a girl's birth and vital events, such as marriage and divorce, in civil registries and also reference them in a digital ID. As the infographics below show, DPI can offer ready access to immunizations, health checks and education. It can help provide pension payments and disability and other social protection safety net benefits.

A DPI life-cycle approach: 0-5 years

Every girl's birth is registered and a national ID number is generated so that every person born is visible and able to receive services.

A baby girl receives the health screenings and immunisations they need to stay healthy.

Both mother and child receive the social protection programmes necessary to ensure adequate nutrition and support in years 0-5 for the child.

A child is enrolled in early learning opportunities.

A DPI life-cycle approach: 6-11 years

Every girl has the health screenings and immunisations they need to stay healthy.

Every girl is enrolled in primary school and girls and their families receive the scholarships and support needed to continue their education.

Every girl is protected from child marriage and girls and their families are connected with the scholarships, social services, and support needed to continue their education

Girls with a disability are linked to the services and benefits to support them to continue their education at school.

Social protection programmes, panicularly those supporting adequate nutrition, are directed to eligible girls.

A DPI life-cycle approach: 12-18 years

Every girl receives targeted information on the health screenings and immunisations they need to stay healthy.

Every girl is enrolled in secondary school. and Girls and their families receive the scholarships and support needed to finish their secondary education.

Age verification safeguards, linked to birth registration and digital ID, support the prevention of child marriage.

Every girl has their school examination record available in an easily accessible format.

Girls are linked to the scholarships needed for them to continue with vocational training and university.

Girls experiencing violence are able to connect to justice and other essential services.

Social protection programmes, including disability services, are directed to eligible girls.

A DPI life-cycle approach: Adulthood

Every woman receives targeted information on the health screenings and immunisations they need to stay healthy.

Every woman can access scholarships and schemes that encourage further learning and vocational training.
Every woman has their academic, vocational, professional training, and contract Information available in an easily accessible format.

Every woman has financial information related to assets and bank accounts avallable in an easily accessible format.

Every woman can connect to markets, services, and government incentives in their sector.

Every woman can find information on the prevention and resolution of illegal work practices

Women experiencing violence are able to access justice and other essential services

Social protection programmes, including disability and family services, are directed to eligible women.

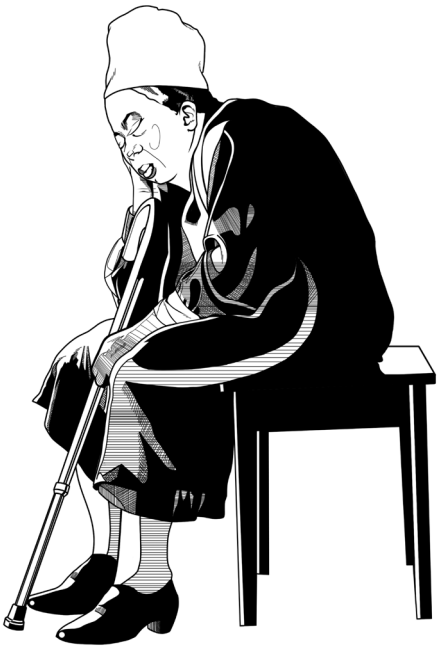
A DPI life-cycle approach: Older.age

Social protection programmes, including disability and family services, are directed to eligible women.

Women receive targeted information on the health screenings and immunisations they need to stay healthy.

Women experiencing violence are able to access justice and other essential services.

Women have financial information related to assets and bank accounts available in an easily accessible format.



HIGHLIGHTING EXEMPLARS AND ENABLERS OF GENDER-INCLUSIVE DPI

This publication is a starting point for engaging with interested DPI ecosystem partners – governments, regulators, technology providers, civil society and community advocates, and donors – on critical steps to make the next wave of DPI innovation truly gender-inclusive.

The following section presents promising examples of how services can be tailored to women and girls, in all their diversity, and support the attainment of the SDGs. Section 3 analyses the strengths and limitations of efforts to create gender-inclusive DPI. It presents two strategies to make progress in closing remaining gaps in services, accessibility and safety for women and girls. Section 4 concludes with recommendations and an emerging roadmap to mainstream gender-inclusive DPI before 2030.

Supporting women and girls to access public services, markets and opportunities is good for women's agency and well-being, for their families and communities, and for the global economy. DPI can and should be a way to achieve these goals at scale. But it will do so only if designed and implemented to serve all people equitably and protect their rights.

2. EXEMPLAR STORIES OF GENDER-INCLUSIVE DPI

The following exemplar stories highlight the incorporation of gender and inclusion as core design principles or objectives in existing and emerging DPI systems.

The first four stories document DPI systems that have already been deployed in a gender-inclusive manner, illustrating the potential of mature systems to benefit women and girls. They include:

- **MOSIP (Modular Open Source Identity Platform):** building digital ID systems through a partnership with Oregon State University and the Aapti Institute to embed inclusion and gender equality
- **HAS (Health Appointment System):** developing healthcare systems personalized to individual and group needs
- **DIKSHA (Digital Infrastructure for Knowledge Sharing):** building networks for students and teachers to learn
- **Digital payments**: collecting and publishing gender-disaggregated data on the use and benefits of digital payment systems

The next four exemplar stories document systems under development that exhibit early promise and insights for gender-inclusive DPI, including:

- **UCI (Unified Care Interface)**: enabling students in India to access protection and support services
- **Talking Justice**: providing migrant workers and women and girls who are victims of trafficking with access to justice and other essential services in their preferred language
- **ONEST (Open Network for Employment and Skill Transformation**): delivering scholarships to girls in secondary school to prevent drop-outs, connecting persons with disabilities to benefits, and linking women in blue- and grey-collar jobs to local work opportunities
- **Age verification safeguard to prevent child marriage**: integrating age verification with digital ID and birth registration systems to prevent child marriage and help girls access social protection programmes

GENDER-INCLUSIVE DPI IN DEPLOYMENT

The following exemplar stories document four DPI systems already deployed in a gender-inclusive manner, illustrating the potential of mature systems to benefit women and girls.

EXEMPLAR STORY 1: MOSIP: IDENTITY FOR ALL

OVERVIEW

Identification is a key enabler of many SDG targets, "such as financial and economic inclusion, social protection, healthcare and education for all, gender equality, child protection, agriculture, good governance, and safe and orderly migration" (World Bank ID4D).

The Modular Open Source Identity Platform (MOSIP) is a DPG that enables countries to design, build and own national digital identity systems. Each country manages and administers its system based on MOSIP modules. Since the platform launched in 2018, 26 countries have adopted it, registering over 155 million people. Secure, interoperable and inclusive digital ID systems help countries fulfil SDG target 16.9, on a legal identity for all by 2030.

Through these systems, MOSIP is improving:

Information and access to a Digital ID

Access to trusted information on services

Streamlined application and eligibility assessments for public service and social protection programmes benefitting women and girls

BUILDING INCLUSION INTO THE DESIGN

MOSIP incorporates inclusion as a design principle. It allows governments to collect a range of disaggregated data, including by gender, location and age, and has been designed with sensitivity to cultural, linguistic and gender barriers to equitable enrolment. Its modular, configurable architecture allows countries to adapt enrolment and authentication to local realities, enabling both online and offline registration in low-connectivity areas.

MOSIP has a range of inclusion features, such as the ability of others to vouch for the identity of those who lack identity documents, support for multiple languages to increase access in areas with linguistic diversity, alternatives to biometrics for those who have missing or hard-to-capture biometrics, in-home registration and multiple modes of verification (through Inji and eSignet). As MOSIP notes in its materials, "these solutions provide secure and convenient citizen verification across various channels, including online/offline, self-service/assisted modes, and are accessible using either smartphones, feature phones, or without a mobile phone. This flexibility allows individuals from diverse backgrounds, including those with limited access to technology or support, to easily access and benefit from the services."

Countries are making additional efforts to extend MOSIP-based ID systems to specific communities. For example, the Philippines is enhancing access for remote communities and those with additional difficulties using portable devices that log data locally; they are later synchronized with a central database. Ethiopia is using MOSIP for a digital ID system to enable refugees and asylum-seekers to access essential services and participate in the formal economy. In 2024, it reached an initial 77,000 individuals, with a goal of 1 million.

MOSIP embeds security by design (building it into the system from the beginning) and privacy by intent (protecting data and ensuring user consent).

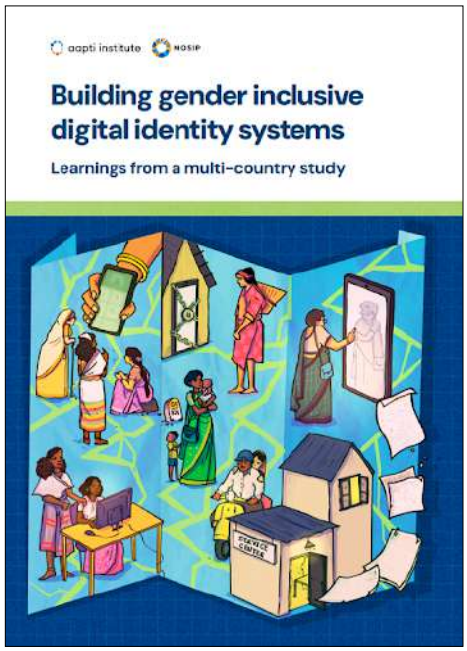
LINKING IDENTITY AND CIVIL REGISTRATION

MOSIP has sought to connect its digital ID with the registration of vital events, such as births. This involves integration with OpenCRVS and other registered DPGs supporting access to social protection programmes, such as OpenG2P. Tonga is currently integrating MOSIP and OpenCRVS.

Integration means that every birth registered will receive a unique identification number for life, generated by the MOSIP system. A mother and child can be readily linked to a range of services, including child immunizations, nutritional support, antenatal and postnatal health check-ups, social protection grants and enrolment in education with scholarship support where needed. At the time of death, the number is deactivated to prevent social protection leakages and other fraudulent activities.

WORKING WITH RESEARCH PARTNERS TO ENSURE GENDER INCLUSION

MOSIP has worked with leading academic and research institutions to embed gender sensitivity into its design and deployment. For example, collaboration with Oregon State University explored gender inclusion in DPGs. Using MOSIP as a case study, the university's GenderMag method identifies "exclusion bugs" in software that



inadvertently disadvantage women and non-technical users. MOSIP applied GenderMag archetypes for inclusive design guidelines that help developers anticipate and remove gender-based barriers in digital ID systems.

Aapti Institute, a think tank studying the intersection of technology and society, has partnered with MOSIP to consider the gendered impacts of digital IDs and how to improve awareness, access and use by women and girls. This research has developed a framework to explain why women and girls may face greater challenges in accessing and using digital IDs than men.

This report was supported by the development of an interactive digital toolkit designed to help developers and deployers of digital ID systems anticipate potential challenges. These include:

- Awareness barriers, comprising information challenges, unfavourable social norms and/or a lack of women's agency
- Access barriers, such as logistics and resource constraints
- Usage barriers, such as affordability, confusing or non-interoperable user interfaces, underrepresentation of women facilitators and interference caused by social norms..

EXEMPLAR STORY 2: SINGAPORE'S HEALTH APPOINTMENT SYSTEM

OVERVIEW

Launched in 2022, Singapore's Health Appointment System (HAS) makes preventive health services and essential vaccinations simpler and more accessible. The system enables citizens to receive personalized health notifications, book appointments seamlessly, and access transparent cost information—all through a single, integrated platform that uses open source coding.

Developed through collaboration between Open Government Products, the Ministry of Health, and the Health Promotion Board, HAS demonstrates how digital systems can bridge information gaps and make preventive healthcare more equitable, especially for women and girls.

Why HAS Matters for Women and Girls

Women and girls face unique barriers to accessing preventive health services. For example, they may lack information on when to have immunizations and health check-ups and where to obtain them or experience anxiety regarding costs.

HAS addresses these challenges through integration with Singapore's national digital ID system. It provides secure and personalized:

- Reminders for vaccinations (e.g., HPV) and important health screenings, based on age and sex.
- Information on clinic locations and costs. HAS simplifies appointment booking by including the nearest health clinic in SMS messages, allowing individuals to click to make an appointment. It also provides individualized cost information based on eligibility for free or discounted health services.

By simplifying health service navigation, HAS helps women make informed, timely healthcare decisions, a critical factor in achieving universal health coverage and reducing preventable diseases such as cervical cancer. This supports SDG 3: Good Health and Well-Being.

The HAS system's real-time data allows the government to monitor immunisation trends by age, gender, and income. Results indicate substantial progress:

- Between November 2022 and July 2025, over 57,000 HPV vaccine appointments were booked through HAS.
- 38,340 women completed their vaccination, reflecting a 65% completion rate.
- Since the introduction of HAS and school-based HPV immunisation in 2021, national HPV uptake has tripled from 14% to 48%.

HAS is an effective complementary service to inform women who are no longer at school of the health benefits of having the HPV vaccine, as well as to indicate where their closest health clinic is and the cost of the vaccination.

EXEMPLAR STORY 3: DIGITAL INFRASTRUCTURE FOR KNOWLEDGE SHARING

OVERVIEW

India's Digital Infrastructure for Knowledge Sharing (DIKSHA) platform is a DPI for school education and teacher training. Launched in 2017 by the Ministry of Education and the National Council of Educational Research and Training, DIKSHA provides a unified digital learning environment for K–12 students and teachers. It connects to India's DPI stack by plugging into digital credentials via DigiLocker, interoperating with identity and data layers, where appropriate, and running on open DPGs. This makes it a sectoral DPI rather than a standalone platform.

Today, DIKSHA supports over 180 million students and 7 million teachers, making it one of the largest education-focused DPIs globally.

Why DIKSHA matters for women and girls

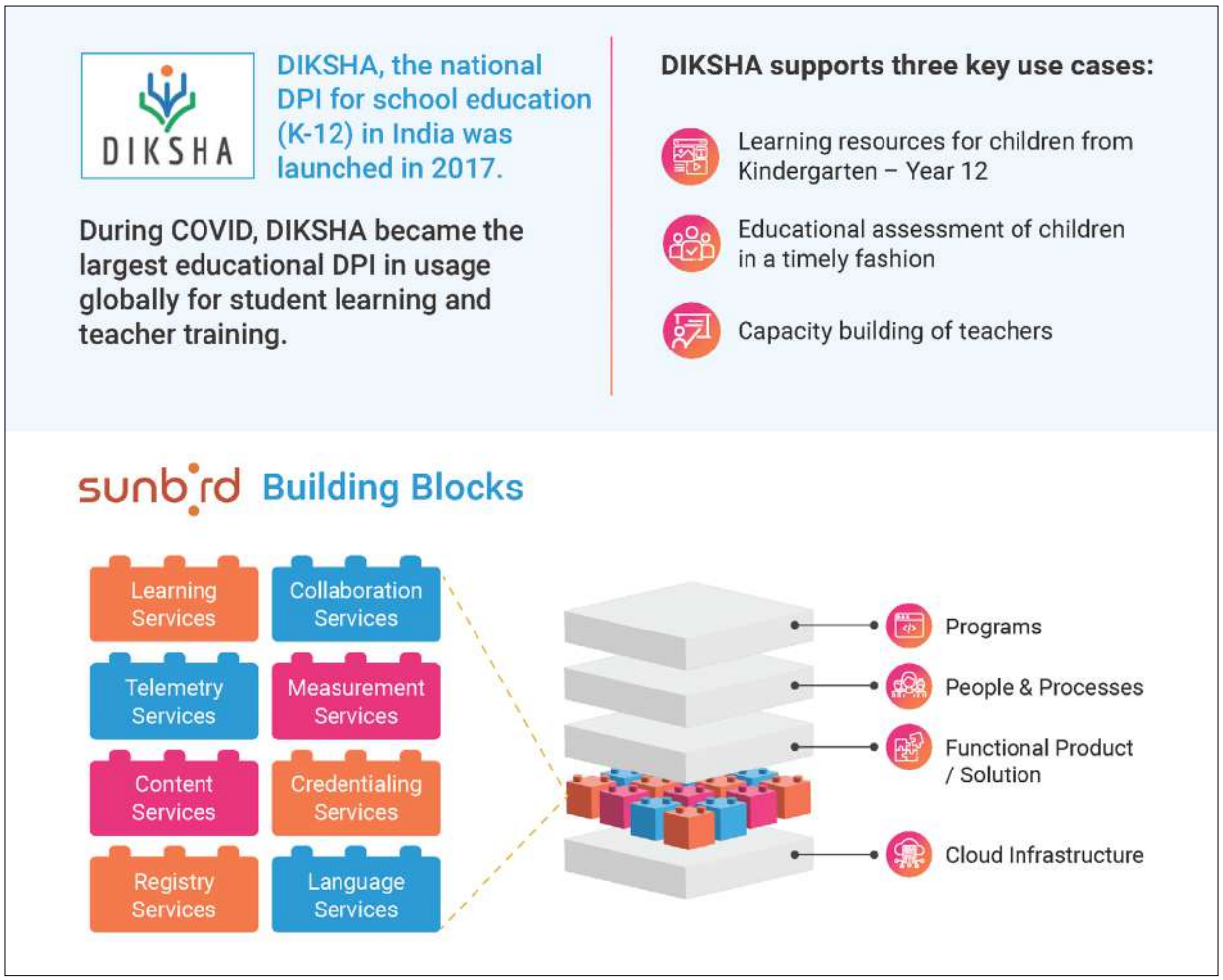
DIKSHA promotes equitable access to quality education, particularly for girls and students in underresourced communities. By providing free multilingual content, it helps girls to continue learning even when social norms, mobility restrictions or financial barriers limit physical attendance.

The platform also strengthens the teaching workforce, of which women constitute a significant proportion, by offering professional development opportunities that improve career progression and pedagogical quality.

DIKSHA includes learning resources, assessments, analytics and support for teachers. Via QR codes, it links with textbooks, video resources and content in various languages. Analytics enable schools and teachers to monitor learning and target support. Additional courses and learning resources have helped more than 145 million teachers gain skills.

DIKSHA's scale and sustainability result from strong and diverse partnerships among the Government, state agencies, civil society and philanthropies. At the core is the Ministry of Education, working alongside the National Council and the Digital India Corporation, which oversee the platform's content governance, technical management and operational delivery. Equally vital are state education boards (60 in total), which adapt and "energize" local textbooks. This helps to keep DIKSHA contextually relevant and accessible to learners across India's considerable linguistic and curricular diversity.

Civil society and philanthropic partners have played pivotal roles in expanding DIKSHA's reach and depth of content. The EkStep Foundation, which incubated the platform, together with organizations such as the Central Square Foundation, Pratham, Azim Premji Foundation and UN Children's Fund (UNICEF), have supported high-quality learning materials, capacity-building for teachers and community outreach.



EXEMPLAR STORY 4: DIGITAL PAYMENTS IN NIGERIA AND BRAZIL

OVERVIEW

Digital payment systems are a cornerstone of DPI for inclusive financial ecosystems. They allow individuals to receive and use money safely, transparently and independently. While many countries have built payment infrastructure, few publish gender-disaggregated usage data that reveal whether these systems truly benefit women.

Brazil and Nigeria have both made efforts to collect, publish and analyse gender- and age-disaggregated data on who uses digital payment services. Brazil has also analysed digital payment data by gender and the receipt of social protection benefits. As more countries adopt this approach, a global community of practice could emerge to share lessons and accelerate gender-inclusive financial innovation.

Why Digital Payments Matter for Women and Girls

Women face structural barriers to financial inclusion, including limited formal identification, restricted mobility, low access to financial institutions and social norms that constrain control over assets. Digital payments directly address these challenges by offering:

- **Safety:** Women can receive wages, remittances and social protection transfers securely, reducing risks associated with cash handling.
- **Autonomy**: Mobile and agent-assisted channels allow women to transact independently, increasing privacy and control over income.
- **Access:** Affordable, instant transactions lower participation costs in markets and financial networks.

Equally important, gender-disaggregated data on digital payments provide policymakers and financial institutions with insights to identify inclusion gaps and design targeted interventions. By analysing who uses digital payment systems, for what purposes and at what frequency, governments can detect patterns of exclusion. These insights enable better policy design for social programmes targeted at women.

Together, the experiences in Brazil and Nigeria show that State-led payment infrastructure, when paired with inclusive design and responsive policy, can provide a foundation for women's economic resilience and participation in the digital economy.

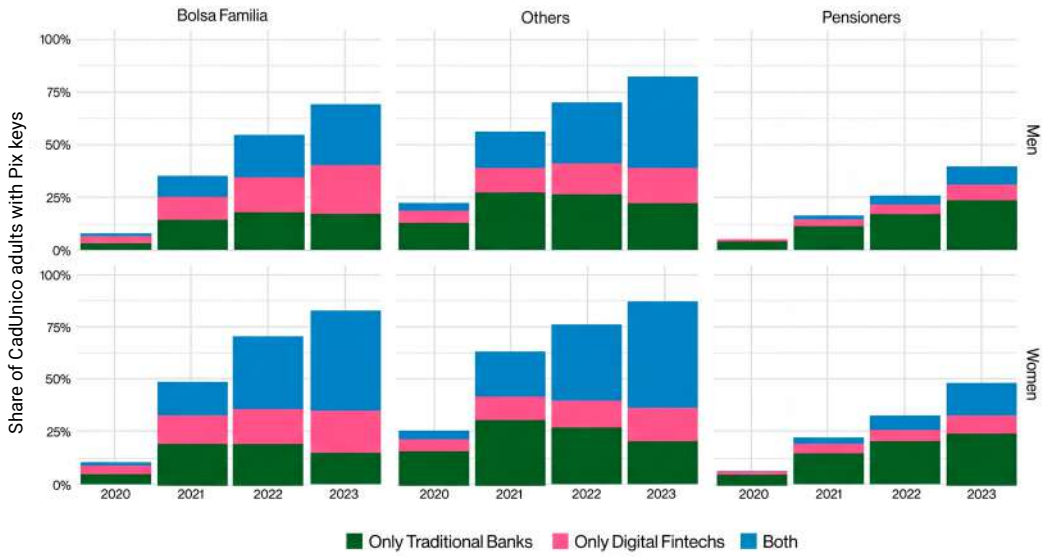
Brazil's PIX

Launched in November 2020, PIX rapidly became Brazil's dominant payment method, particularly for users of social welfare programmes such as Bolsa Familia. Within one month of its launch, 16 per cent of adults in the Single Registry for Social Programmes (CadÚnico) had registered a PIX key. By December 2023, adoption among them had reached nearly 90 per cent.

Prior to PIX, the Central Bank of Brazil assessed women's needs and communicated what PIX would do. Its PIX development team surveyed women on why they used cash and what incentives would accelerate the adoption of PIX. This reflected an understanding that PIX needed to be a good product and that people needed to understand how it could make their lives easier. The survey informed public education and awareness campaigns in partnership with civil society organizations and social media influencers.

One key study of PIX noted: "Social-welfare programs can serve as strategic entry points for financial inclusion, by linking disbursements to basic savings accounts and other entry-level financial products." Such programmes tend to have a disproportionate impact on women, since "women generally have higher adoption rates and financial engagement". Indeed, women consistently held a higher proportion of registered PIX keys than men across all subgroups and years studied. The study elaborated, "Gender-specific policies should be based on the thorough understanding of the gender-specific motivations for the usage of financial services, and of how specific policies could bridge financial access gaps while avoiding overindebtedness."

Proportion of CadUnico adults who have at least one Pix key, by subgroup, sex and type of financial institution



Source: Brazil's journey toward financial inclusion: Midterm report.

The Central Bank of Brazil's 2021 Annual Report and more recent data prepared by the Central Bank of Brazil demonstrates that well-designed payment infrastructure, aligned with social policies, can significantly increase women's financial inclusion, particularly among low-income groups.

Data analysed by the Central Bank of Brazil in December 2023, 2024 and 2025 show that while women form the majority of PIX users, 52 per cent in both Dec 2023 and Dec 2025, they account for 49 per cent of PIX transactions (down from 50 per cent in Dec 2023) and only 41 per cent of the value of PIX transactions (down from 42 per cent in Dec 2023). Only by analysing these data trends can policy makers take appropriate steps.

Number of PIX users, transactions and value by gender in Dec 2023, 2024 and 2025

Year/Month	Gender	#Users	#Transactions	Value (BRL)
202512	Female	73953229	3012861191	R$ 490,364,204,288.35
202512	Male	68051534	3164887133	R$ 701,755,830,399.44
202512	Not informed	6374	199464	R$ 44,393,274.01
202412	Female	69891958	2485911153	R$ 405,952,782,051.80
202412	Male	64098807	2556001749	R$ 577,913,553,238.69
202412	Not informed	6190	159989	R$ 35,913,776.64
202312	Female	63353905	1877817375	R$ 307,526,961,371.34
202312	Male	57600825	1891525904	R$ 431,086,974,274.13
202312	Not informed	5301	119710	R$ 28,339,547.99

Source: Central Bank of Brazil, Pix Management and Operation

Brazil's experience shows that gender-disaggregated data and inclusive policy frameworks are essential in steering DPI to serve women.

Nigeria's Women's Financial Inclusion Dashboard

Nigeria's Women's Financial Inclusion Dashboard was established to close data gaps on women's access to and use of financial products and services. It aims to provide real-time, gender-disaggregated information on financial transactions, including digital payments, enabling policymakers and service providers to better understand opportunities and challenges for women. The dashboard supports:

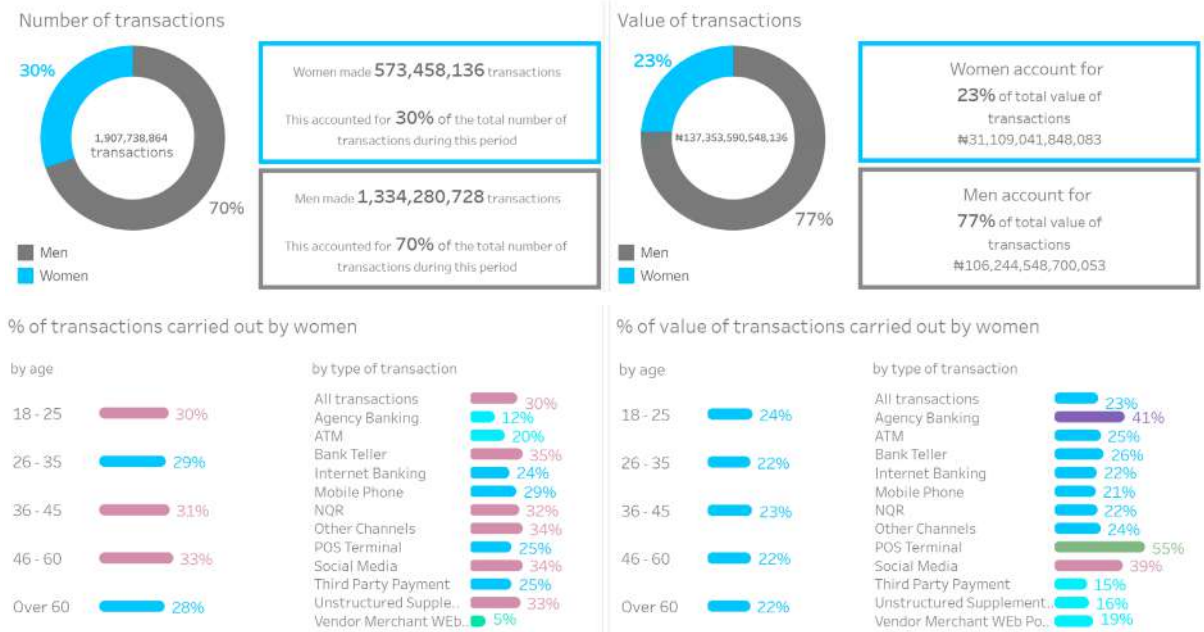
- Evidence-based policymaking and the design of tailored products and services to advance women's financial inclusion
- Data-sharing across banks and non-bank financial institutions to identify trends and measure progress

The Central Bank of Nigeria supports the dashboard in partnership with the Nigerian Interbank Settlement System, Financial Inclusion Governance committee members and ConsumerCentriX.

Looking at transactions from January through October 2025, dashboard data show that:

- Women conducted approximately 31 per cent of transactions, compared to 69 per cent by men.
- Women accounted for 23 per cent of the total transaction value, compared to 77 per cent for men.

Number and percentage of transactions by gender, age and value from January-October 2025



Source: Nigerian Women's Financial Inclusion Dashboard

GENDER-INCLUSIVE DPI IN DEVELOPMENT

The following exemplar stories highlight DPI use cases that are still in development but have not yet reached full deployment or scale. Despite their nascent status, they offer insights on DPI's potential to advance gender equality.

EXEMPLAR STORY 5: UNIFIED CARE INTERFACE (UCI)

OVERVIEW

The Unified Care Interface (UCI) supports mental health among youth. It offers a first line of anonymous interactions with skilled, trusted adults from local communities via digital channels. UCI was co-designed by the Centre for Digital Public Infrastructure and over 20 organizations across India, spanning child welfare, law and policy, and technology, in collaboration with the Government.

UCI builds three layers of trust: in people, in interaction through the system and in the system's ongoing accessibility. Adults providing social and emotional support have verifiable credentials to prevent the misrepresentation of skills or identity. UCI anonymizes users through text-based interactions to mitigate

risks of stigma, shame or fear of backlash. Interactions occur across a range of QR code-based web links, government websites and mobile apps. Plans call for scaling up the system through service providers.

A DPI approach to mental health

UCI harnesses DPI to address mental health goals and challenges. Key design choices include:

a. **Interoperability**: UCI can be accessed through any government website, community mobile app or anonymous web links. All interactions operate seamlessly, securely, and interoperably.
b. **Minimalist, reusable blocks:** UCI creates registries of trusted adults in local communities who can be reached through any trusted point of digital connection. Digitally verifiable skill credentials attest to the legitimacy of adult guides.
c. **Diverse, inclusive innovation:** To support rapid scale-up and decentralization, UCI works with the Government to empanel a cohort of service providers who train guides and onboard adolescents. They receive a small financial incentive for each unique enrolment and verified interaction.
d. **Federated and decentralized**: UCI creates a network of local champions with no central data storage. It allows interactions through different channels.
e. **Security and privacy by design:** In addition to technology safeguards that secure UCI at scale, key design choices, such as anonymous interaction by adolescents, multimodal touchpoints and tiered escalation frameworks, help safeguard privacy and security.

EXEMPLAR STORY 6: TALKING JUSTICE

OVERVIEW

Women and girls comprise the majority of victims of trafficking in persons identified globally and in Thailand. Yet in 2024, only 1 in 6 victims in Thailand obtained compensation for being a victim of crime, despite being identified as such by the Government.

Talking Justice is being designed to allow migrant workers and people who have been trafficked or experienced labour exploitation to access reliable information on available services, justice remedies (such as applying for compensation or filing a labour grievance to receive unpaid or underpaid wages), and referrals to shelter, health, training and other services. They may use their voice and preferred languages from countries in the Association of Southeast Asian Nations (ASEAN).

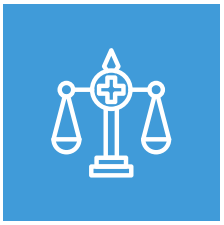
Talking Justice is being developed as a DPG but could be designed to operate as a DPI, integrating with ID systems and cross-border digital payment mechanisms across ASEAN. This could expand support for migrant workers and TIP victims to seek remedies and access a broad range of services and labour grievance mechanisms in countries where they work. It would facilitate the disbursement of compensation payments.
Talking Justice is a collaboration involving Agami, OpenNyAI, AI Singapore, the Southeast Asian Languages in One Network (SEA-LION), the Mast Human Civil Society Organisation and Thailand's Ministry of

Justice. It supports three key targets under SDGs 5, 8 and 16: target 5.2, on ending all violence against and exploitation of women and girls; target 8.7 on ending modern slavery, trafficking and child labour; and target 16.3, on promoting the rule of law and ensuring equal access to justice.

What Talking Justice Will Deliver for Women and Girls

Trusted information on services.

Connection with lawyers, paralegals, health, and other essential service providers, connecting to a network of available government, civil society, and private sector resources.



Justice remedies such as applications for unpaid wages and victims of crime compensation.

Gender disaggregated data for policy advocacy and reform.

Challenges that Talking Justice Will Help Solve for Women and Girls

The current Department of Labour Protection and Welfare (DLPW) online system for seeking payment of wages assumes fluency in the Thai language and provides no built-in interpreter support. This presents a major barrier, particularly for workers with limited literacy, low digital familiarity or a lack of support networks. As a result, the burden falls on workers to file grievances in person, which not only requires time and travel but also increases their exposure to employers, a dynamic that discourages many from acting.

Talking Justice is designed to break both literacy and language barriers and to be delivered through different modes or channels to reach everyone in a way that works for them, whether through face-to-face services, radio shows, podcasts, social media apps or website portals.

A multilingual, multimodal, artificial intelligence-supported grievance platform that integrates SEA-LION and links directly to the official grievance system enables workers to file complaints safely, privately and in their own language, directly from their phones or community centres. Integrating automated translation, conversational guidance and built-in referrals to legal or psychosocial services would remove critical friction points in the current DLPW system. Beyond convenience, the Talking Justice approach centres worker safety, dignity and empowerment. It could significantly improve the reach and responsiveness of labour protections in Thailand.

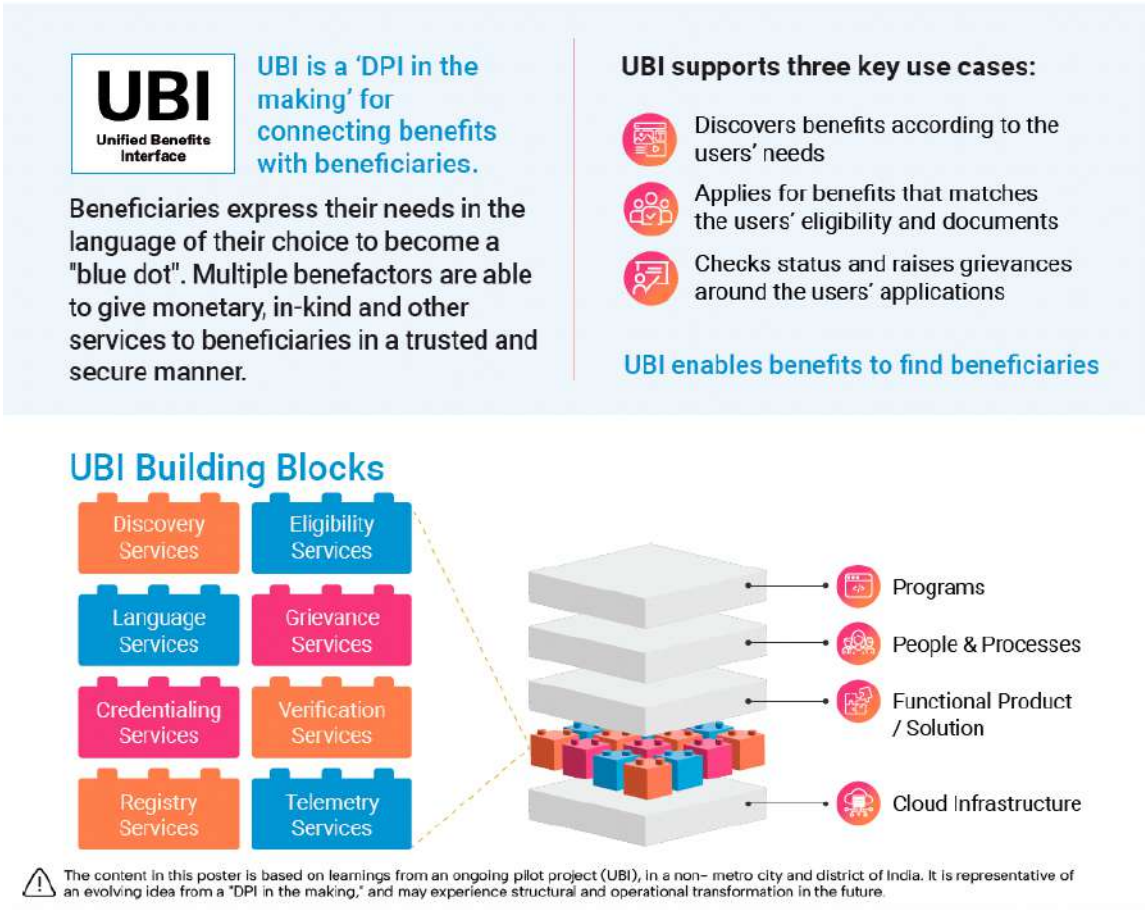
EXEMPLAR STORY 7: OPEN NETWORK FOR EMPLOYMENT AND SKILLING TRANSFORMATION

OVERVIEW

The EkStep Foundation incubated a DPI, the Open Network for Employment and Skill Transformation (ONEST), to facilitate access to education and employment for women and girls, particularly those with disabilities. Through an open protocol that links various platforms, ONEST helps individuals, employers, funders and government agencies more easily find and share work opportunities, scholarships and other benefits, and identify candidates. Additional discovery and verification services can be built on top of this foundation.

Early Results to Address Key Challenges Facing Women and Girls			
Use Case	**Key Challenges**	**ONEST Approach**	**Early Examples and Results**
Scholarships for Girls 	• Low awareness: Less than 20 percent of citizens know about available scholarships • Complex documentation across multiple ministries and funders • Long verification timelines (up to 6 months)	• Introduce artificial intelligence-enabled voice services for multilingual information access • Unbundle and digitised forms to reduce paperwork • Deploy Digi-Attestation for instant digital verification (30 minutes to less than 3 seconds)	• **Educate Girls–EkStep pilot:** Enabled grade 10 girls from underprivileged families to apply digitally for corporate social responsibility and philanthropic scholarships. Many girls retained in school who otherwise risked dropping out due to exam fee barriers.

Scholarships for Persons with Disabilities 	• Low discovery and awareness of disability-related schemes • Lack of trusted digital credentials for eligibility verification • Delayed disbursements (6+ months)	• Developed Unified Benefits Interface (UBI) under ONEST to digitize eligibility proof and enable real-time verification through Digi-Attestation • Simplified discovery and application process for beneficiaries and funders	**Pilots in Patna and Hardwar:** • Scholarship approvals reduced from 6 months to 2 minutes; disbursements same day • Administrative workload dropped sharply; funder costs near zero • Beneficiaries received timely cash and in-kind aid
Employment for Women 	• Limited job discovery for blue- and grey-collar roles (90% of India's workforce) • Few trusted, verifiable digital profiles for women jobseekers • Social norms, safety, and mobility constraints • Lack of vernacular and voice interfaces	• Built digital infrastructure and artificial intelligence-assisted tools enabling women to create verifiable job profiles and broadcast work preferences • Enabled employers to post jobs digitally and discover verified candidates • Integrated voice and local language access for inclusion.	**Early pilots:** • Nudge Foundation leading Digital Naukri Challenge pilots for remote/task-based work for women • Emerging networks linking local employers and jobseekers in Dharwad, Karnataka • Sanmati 2.0 exploring scale-up of digital work models to boost women's participation



EXEMPLAR STORY 8: AGE VERIFICATION SAFEGUARD TO PREVENT CHILD MARRIAGE

OVERVIEW

This initiative aims to integrate an age verification safeguard within the MOSIP digital ID system, using the OpenCRVS platform. This helps to prevent child marriage by allowing marriage officiants to verify the ages of both potential marriage parties. It could also assist girls and their families in accessing social protection programmes that encourage continued education rather than early marriage. The initiative addresses SDG target 5.3, on eliminating all harmful practices, such as child, early and forced marriage.

OpenCRVS is an open-source digital platform for civil registration recognized as a registered DPG and designed to meet the needs of all countries, especially those with low-resource environments. It represents a global standard for digital civil registration, supporting inclusive service delivery, while enabling governments to maintain full local ownership and control. With no vendor lock-in or licensing costs, OpenCRVS is a sustainable, non-proprietary solution that can be scaled up nationally and integrated seamlessly into national identity and social protection systems.

By combining inclusive design, technical scalability and deep interoperability, OpenCRVS enables governments to deliver trusted, legally compliant and digitally integrated civil registration systems. These serve as the foundation of effective identity management and digital public infrastructure.

What OpenCRVS and MOSIP will deliver for women and girls

Information and access to Digital ID and Civil Registration documents

Streamlined application and eligibility assessment for public services and social protection programmes benefitting women and girls

Trusted information on services.

Gender disaggregated data for policy advocacy and reform.

Proof-of-Concept: Age-Verification Safeguard to Prevent Child Marriage

Marriages can take place in both religious or cultural and civil registry settings. MOSIP and OpenCRVS can verify the age of people married in both cases. Where marriage is not directly certified by a civil registry, religious or cultural leaders can still use MOSIP and OpenCRVS for age verification, for which they are commonly legally responsible. The full proof-of-concept can be viewed here.

The age verification safeguard tool aims to support:

- National and global efforts to increase information dissemination, counselling and advocacy around ending child marriage, developed with government entities, youth organizations, civil society partners and religious/cultural leaders who officiate marriages
- Greater awareness among children, adolescents and communities of a broad range of social protection services supporting better health and education for children and adolescents under age 18

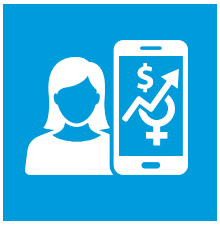
The age verification safeguard tool is one part of a much broader array of policy interventions aimed at preventing child marriage.

3. ANALYSIS: HURDLES AND ENABLERS FOR GENDER-INCLUSIVE DPI

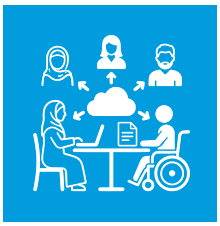
While DPI improves inclusion and access to services for many, gender-inclusive DPI is not yet the norm. The exemplar stories show many ways to embed gender inclusion as a core principle of DPI. They also illustrate how women and girls may rely on DPI differently across the stages of their lives, and how women and girls can and should shape DPI through its conceptualization, design, development and operation.

What works currently for women and girls:

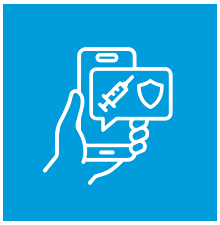
Multimodal access to services: Voice-first interfaces, offline functionality and trusted human intermediaries can enable access, regardless of literacy, connectivity or device ownership (e.g., MOSIP and UCI)



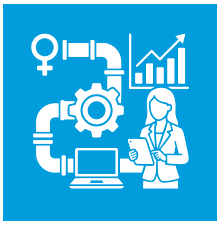
Financial inclusion: Cash transfer programmes linked to digital accounts have proven effective in driving women's financial inclusion (e.g., Digital Payments in Brazil and Nigeria)



Community-led solutions: Collaboration with women's organizations and local paralegal services can help understand challenges to women and girls accessing services and define safe, effective service delivery and improvements in digital literacy (e.g., Haqdarshak, see enabler 1)

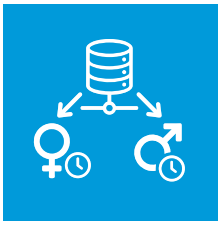


Simplified service access: SMS updates can simplify access to immunization and health-check information (e.g., HAS)



Digital literacy and mentorship: Investment in girls' access to STEM (science, Digital Literacy and Mentorship technology, engineering and maths) education as well as hackathons, internships and mentorship to provide opportunities to solve real-world problems can increase the pipeline of women designing and implementing DPI (see enabler 2)

What needs further work:



Data gaps: Limited data disaggregated by age and gender exist to inform DPI policy decisions. The Digital Public Infrastructure Map highlights 97 digital payment systems with a public interest operator, yet only a fraction publish gender-disaggregated data. Such information is vital for demonstrating how women and girls use services and the impact of DPI.

Investment in gender-intentional DPI: Some funders, such as the Gates Foundation, explicitly analyse the "gender intentionality" of potential grants. This practice incentivizes gender-intentional design and implementation. It enables greater clarity on resources dedicated to gender-inclusive DPI.

Design processes: There is limited clarity on how designing DPI can take place "by and with" women and girls rather than "for" them. User testing with women and girls is often not documented. It can highlight the need for women-friendly digital access points at places they visit and trust with support from "digital friends" to help navigate the digital world and increase digital inclusion (Kumar, 2025).

Communicate shared benefits: Clear communication would convey how better DPI design for women and girls contributes to greater inclusion for everyone (Level 1 Project, 2025).

Two critical ongoing needs are: first, to close "last-mile" gaps in service access so that DPI can help enable universal access, including for women and girls, and second, to provide equal opportunities for women and girls to participate in shaping DPI. The following examples highlight "DPI enablers". These practices and programmes address lingering concerns in realizing DPI's potential to accelerate positive outcomes for all women and girls.

ENABLER 1: CLOSE LAST-MILE GAPS IN SERVICE DELIVERY VIA DEDICATED RESOURCES AND SUPPORT FOR WOMEN

When considering DPI approaches, it is important to keep in mind that women and girls will continue to access services, information, remedies and markets in ways that work best for them, through digital and non-digital channels. These may include face-to-face interactions with the front-line services they trust, radio shows, podcasts, social media apps, phone calls or website portals. While DPI establishes foundational infrastructure, user experiences are shaped by service design choices, some of which can lead to "last-mile" service gaps. Each enabler example below presents ways to overcome these.

HAQDARSHAK'S LAST-MILE SOCIAL PROTECTION DELIVERY

Haqdarshak aims to address generational poverty in India by reimagining the delivery of social protection services. Through a for-profit model in 24 of 30 states, Haqdarshak designs and implements agent-based and direct-to-beneficiary programmes to make links to welfare schemes.

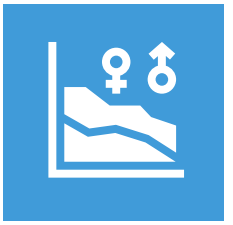
Haqdarshak's business model strives to close gaps between benefit issuers and recipients through agents, information-sharing and financial services. This approach leverages and complements existing DPI. Trained field agents, called haqdarshaks, assist users in discovering benefits for which they are eligible and support them with application and grievance redressal processes. Haqdarshak charges a fee paid by individuals to their agent or by governments or other donors to cover the service cost. As of 2024, it had reached 6.7 million people; 95 per cent had accessed benefits totalling $2.2 billion.

Hakdarshak's model builds on four pillars:

Trusted information on services.

Streamlined application and eligibility assessment for public services and social protection programmes benefitting women and girls

Information and access to Digital ID and Civil Registration documents



Gender disaggregated data for policy advocacy and reform.

Solutions that Haqdarshak Aims to Provide for Women and Girls

Haqdarshak systematically collects and publishes data to measure its impact, particularly on the lives of women and girls. These metrics capture reach, benefits delivered and economic value unlocked across India. As of November 2024, 56 per cent of benefit recipients were women. More than half of 85,000 microenterprises supported were led by women.

Beyond providing access to welfare, Haqdarshak creates income-generating opportunities for women, who serve as local agents and micro-entrpreneurs. This generates a multiplier effect of grass-roots socioeconomic empowerment. To date, more than 43,000 Haqdarshak agents have been trained; two thirds are women.

GRAM VAANI PARTICIPATORY MOBILE PLATFORM TO ENGAGE WITH HARD-TO-REACH COMMUNITIES

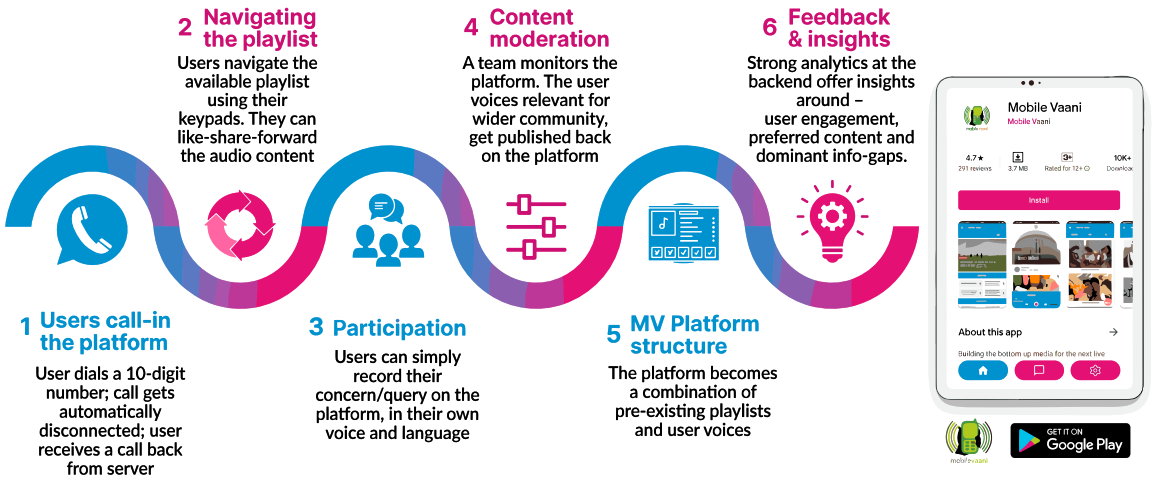
Gram Vaani is a mobile platform that provides access to trusted information without requiring an Internet connection or smartphone. It allows users to ask a question or share a grievance about a social protection programme, other public service or something else they have experienced and want information on.

The figure below shows how this platform informs, engages and hears voices from hard-to-reach communities. Gram Vaani works on even simple feature phones, using interactive voice response system technology. Collaboration with community volunteers has established a voice-based community media platform, Meri Awaz Meri Pehchan, or My Voice My Identity, focused on issues including political participation in local governance, maternal health and nutrition, early marriage and family violence.

Gram Vaani's social infrastructure has been important in facilitating access to social welfare schemes and government entitlements while addressing gaps in grievance redressal in welfare delivery. It has contributed to schemes related to agriculture, health, employment and labour welfare, and financial inclusion. While foundational DPIs such as Aadhaar (identity) and UPI (payments) provide the "rails", Gram Vaani adds a participatory layer to make these systems inclusive and accountable. It ensures that the most underserved segments of the rural and urban population, who may be "digitally excluded", can still engage with digital governance and services through simple voice calls.

MOBILE VAANI - HOW DOES IT WORK?

A participatory mobile platform to **inform, engage and hear** voices from **hard-to-reach communities.**



Mobile Vaani IVR process flow

CBOARD: INCLUSIVE COMMUNICATIONS TOOLS FOR WOMEN AND GIRLS WITH DISABILITIES

OVERVIEW

Cboard is an open-source augmentative and alternative communication (AAC) application and registered DPG that enables children and adults with speech impairments to communicate through customizable pictogram-based boards and text-to-speech voice synthesis.

Cboard was designed as a low-cost, adaptable app, accessible on computers, tablets and smartphones. It allows offline use in remote areas with limited Internet access. Cboard was co-designed by women and girls; educators and users actively shape its features and implementation to meet real needs rather than assumed ones. To extend access to low-income and minority communities, Cboard Premium is completely free in almost all of Africa, most of Asia and Latin America, and parts of Europe. Communities with otherwise limited access to assistive technology in their local language can access Cboard.

Since its launch with UNICEF Office of Innovation support in 2017, Cboard has been deployed in multiple countries, including Timor-Leste and Uruguay, as well as the Western Balkans. In Uruguay, it has become part of DPI and national education policy through Plan Ceibal.

Why Cboard matters for women and girls

Women and girls with speech and language impairments face profound barriers to equitable education, healthcare and services. When they are unable to communicate, they become more susceptible to violence and have a higher chance of experiencing exclusion. Without adequate communications tools in the local language, women often remain invisible in institutional systems and cannot fully participate in society.

Cboard supports over 45 languages and allows users to adapt its pictogram-based boards to make them

culturally relevant. Women and girls have been central to all user testing, allowing the app to be built on their needs.

Cboard empowers women and girls to communicate pain, symptoms and concerns to health professionals, including reporting abuse, which supports autonomy in healthcare. Equal participation in learning environments helps girls build foundational communication and literacy skills with teacher-customized AAC boards. Cboard helps close gaps shaped by gender, disability, poverty and geography. It supports minority languages and offers high- and low-tech solutions.

Building inclusion into the design

The 2023 pilot in Timor-Leste illustrated the impact of community-centred design:

Local partnerships: Engagement with schools serving children with disabilities

Capacity building: Teachers trained to adapt communication boards for each student

Localization: Full translation into Tetum with local voice recordings, and choice of modes, both digital and fully offline printed boards based on school infrastructure

Measuring gender impact: Increased confidence and participation based on the Psychosocial Impact of Assistive Devices Scale

ENABLER 2: CAPACITY-BUILDING AND RECOGNITION FOR WOMEN AND GIRLS SHAPING DPI

Ensuring that women participate in designing, developing and deploying DPI helps create solutions that better reflect women's real experiences with access, safety and usability in public and digital services.

Supporting women and girls to study, complete and work in STEM expands their opportunities and strengthens countries' abilities to design inclusive DPI. When women help build digital ID, payments and data systems, they better reflect real community needs. According to a UN Women brief, however, "women remain a minority in both STEM education and careers, representing only 28 per cent of engineering graduates, 22 per cent of artificial intelligence workers and less than one third of tech sector employees globally. Without equal representation in these fields, women's participation in shaping technology, research, investments and policy will remain critically limited."

GovStack Women in GovTech Challenge

The GovStack Women in GovTech Challenge (WiGT Challenge) responds to women's significant underrepresentation "by empowering women to design and develop safe, inclusive, and citizen-centric digital government services while fostering a strong international network of women leaders in GovTech".

The WiGT Challenge has launched its third cohort, building on the success of its previous editions, which together trained **319 women** from **over 50 countries**. With a growing network of digital innovators, the 2026 edition will take a step further, empowering women to go beyond service design and **develop full digital service prototypes.**

In partnership with the **World Bank**, the **DPI Safeguards Initiative** (stewarded by the UN Office for Digital and Emerging Technologies and UN Development Programme), the University College of London Institute for Innovation and Public Purpose and GovInsider, the WiGT Challenge 2026 offers a hands-on journey for women to design and build inclusive, citizen-centric digital government services using the **GovStack** approach and **DPI Safeguards.** Women professionals from diverse backgrounds are invited to join as mentees or mentors to learn, collaborate and lead the next generation of GovTech innovation.

Finalists are building DPI-enabled services to address specific needs among women and girls. For example, GovSpark addresses the widespread and underreported issue of violence against women by providing a secure, anonymous digital platform for incident reporting and case management.

For initiatives like the WiGT Challenge to succeed, an ecosystem of organizations and policies must be in place, enabling women to lead teams that design and build the gender-inclusive DPI of the future. Organizations investing in women's involvement in the broader tech ecosystem include:

AnitaB.org India, which mentors and trains women to pursue and maintain careers in technology, including through the Grace Hopper Celebration India, Asia's largest gathering of women in technology.

AirTrunk, a tech company with two gender-inclusion targets in its sustainability-linked loan financing for data centre infrastructure. These comprise maintaining at least 35 per cent female representation company-wide and achieving 40 per cent by 2030, and improving gender pay equity. If these targets are met, all loan margin reductions are directed to the company's Social Impact Fund, which supports initiatives with positive impact.

Tink Her Hack hackathon, one of the world's largest women-only overnight hackathons, with a goal to empower young women makers to build, innovate and solve real-world challenges in their communities.

Tecendo Futuros (Weaving Futures), an initiative in Brazil to engage youth organizations and technology start-ups to co-create DPGs in the domains of environment and culture.

Linking these initiatives to gender-inclusive DPI will allow more women and girls to contribute their expertise to designing and building DPI through 2030 and beyond.

4. CONCLUSION: A ROADMAP TO GENDER-INCLUSIVE DPI

The exemplar and enabler stories highlight how a gender-inclusive DPI approach, policies and community-based social change interventions have worked together. They have delivered society-wide benefits while addressing challenges faced by women and girls in accessing essential services, opportunities and markets.

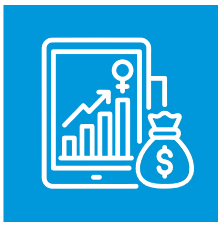
The government agencies, civil society advocates and DPI designers contributing to these stories know that more must be done. Yet the stories reveal genuine progress and a willingness to explore innovations. They also highlight some gaps to address.

As noted above, to be gender-inclusive, DPI should:

- Be designed and implemented through multistakeholder governance arrangements centred on community engagement that includes the contributions of women and girls
- Address key challenges women and girls face in accessing and using services in a safe and secure manner
- Enable the collection and sharing of gender-disaggregated data to regularly measure the differential impacts of DPI.

The following recommended actions aim to orient different actors in support of gender-inclusive DPI. They focus on increased investment in gender-inclusive DPI, the design and building of DPI with and by women and girls, and the collection and analysis of gender-disaggregated data on differential impacts.

Leading up to 2030, work related to this current report will continue through co-created guidance on gender-inclusive DPI governance, engagement and design, as well as more systematic data collection and publication. The authors invite governments, regulators, civil society, donors and technology providers to join this effort.



Recommendation 1: Invest at scale in gender-inclusive DPI to address challenges faced by women and girls.

Action I: Donors and other partners should **invest in the design and deployment of gender-inclusive DPI across sectors**, including health, education, social protection and justice, so that multiple services better support girls and woman across their lives. They should report on these investments using the indicators proposed in recommendation 3.

For example, **governments and civil society organizations** can co-design national DPI use cases with a focus on child and maternal healthcare to demonstrate how a range of service elements

connect at this point, including digital IDs and birth registration, child social protection grants, immunizations, nutritional support, antenatal and postnatal check-ups for the mother and baby, and the prevention and response to family violence, which can escalate around the birth of a child.

Action II: Donors and other partners should **invest in the research, development and engagement required to identify how to address societal challenges facing women and girls** through existing DPI and DPGs, making these more gender intentional, as well as to identify potential new developments if required.

Action III: Regulators, donors and technology enablers should **support the development of gender-inclusive standards** and a guidance note that identifies concrete ways to design DPI to inform better access, agency and outcomes for women and girls, highlighting how DPI design and implementation addresses challenges they face. The standards could be used in assessing elements of points 8 (adherence to standards and best practices), 9 (do no harm by design) and 9a (data privacy and security) in the Digital Public Goods Alliance DPG Standard.

Action IV: Governments and donors should **adopt gender markers** to track whether DPI investment is gender unintentional, gender intentional or gender transformational.

Educational institutions and donors should support the development of a gender-inclusive DPI training module. It should be included in existing DPI training courses to help governments and donors assess DPI investments.

Action V: Government, regulators and donors should document how governance, as well as safeguarding and procurement mechanisms supporting DPI, **include women and girls, throughout the life cycle, and protect their rights and safety.**

Recommendation 2: Design and build DPI with and by women and girls from the start, and include their perspectives throughout the cycle of design, development, deployment, reflection and review.

Action VI: Governments and DPI developers should **engage with grass-roots community actors and women's organizations in multistakeholder dialogues to understand the problems and barriers faced by women and girls,** and their awareness, access and use of services. By co-designing with these communities, DPI developers can deliver programmes that meet the needs of women and girls, in all their diversity and across the life cycle.

Action VII: Governments and technology providers should **design and build gender-inclusive DPI using teams with female computer engineers and designers.** Supporting girls and women to study and pursue careers in STEM, partnering with local women in technology programmes, and engaging with women-focused hackathons and organizations that mentor girls and women to lead in tech innovation will help

improve understanding of gendered barriers in digital interfaces.

Action VIII: Governments and technology providers should **incorporate design elements that overcome the barriers women and girls face in accessing services.** This process includes innovations allowing women and girls to:

- Engage through voice and text, using their preferred spoken language, with front-line service partners or digital AI agents; this would bridge language and literacy barriers and support inclusion.
- Use both digital and non-digital modes to obtain services. Universal coverage and accessibility can be facilitated through multimodal channels that reach everyone in ways that work for them, such as face-to-face services, radio shows, podcasts, social media apps and/or website portals.
- Use DPI that is disability-inclusive by design and aligned with global standards.

Action IX: Governments and donors should **collaborate with civil society organizations and community leaders to jointly develop communications campaigns** that explain how women and girls benefit from services built on DPI. Clear communication about the collection and handling of data, and the embedding of data safety and privacy objectives, are critical to building trust. The safety of women and girls is a core DPI Safeguards principle.

Recommendation 3: Collect gender-disaggregated data on the impact of DPI for all genders, including outcomes related to awareness, access and use.

Action X: Governments, regulators, donors and technology enablers should **collaborate to develop an inclusion measurement methodology** defining which gender- and age-disaggregated data should be collected, analysed and published, including best practices for data protection and privacy.

Action XI: Governments, regulators, donors and technology enablers should **collect, analyse and publish gender- and age-disaggregated data to understand the impacts of DPI** on women and girls and other genders. Governments, technology enablers, and civil society and community advocates should use gender-disaggregated data to support DPI policy, design and deployment choices that may enhance outcomes for women and girls. Supported by regional and global institutions, such actors should highlight good practices and, through regional consultations, explore how to support more countries in adopting them. One example is the collection, analysis and publication of gender-disaggregated data on digital transactions by the central banks of Brazil and Nigeria.

Action XII: Governments and donors should collaborate with technology enablers and civil society organizations to **narrate stories about the value of DPI for women and girls,** documenting challenges and successes in delivering services and opportunities.

Gender-disaggregated data can help tell the story of how DPI impacts women and girls and demonstrate how it can help solve problems experienced by half the world's population. Without gender-disaggregated data in open, accessible formats, national policymakers are unable to make informed decisions to improve the well-being of women and girls. Better gender-disaggregated data will help build trust, nationally and

globally, that DPI delivers benefits for all citizens.

> Progress on the Sustainable Development Goals: The Gender Snapshot 2025 sounds the alarm: If current trends continue, the world will reach 2030 with 351 million women and girls still living in extreme poverty, and the Sustainable Development Goals, particularly SDG 5 – to achieve gender equality and empower all women and girls – missed.
>
> This is not inevitable – it would be a political outcome, shaped by systemic neglect, stalled investments, and a retreat from equality. But the data also make clear: a different path is still possible. If we chose to invest even in just one concrete action, to close the gender digital divide, 343.5 million women and girls globally could benefit, lifting 30 million women and girls out of poverty by 2050 and generating a $1.5 trillion windfall in global GDP by 2030.

The Centre for Digital Public Infrastructure, Co-Develop and UN Women have collaborated on this publication with the hope that joint action on its recommendations will deliver the potential of DPI for everyone. Governments, regulators, donors, civil society advocates and technology enablers all have roles to play in making DPI work for women and girls and documenting many more stories of success by 2030.

Appendix: Timeline of DPI Development

The timeline below shows the first DPI implementation use case as X-Road in 2001. It also highlights recent DPI regulatory milestones and tools developed to assist countries and DPI ecosystem partners.

2001 X-Road (Data Exchange DPI Estonia, Finland and Iceland)

2014 Principles for Digital Development (updated in 2024)

2019 Digital Public Goods Alliance established

2020 UN Secretary General's Roadmap for Digital Cooperation,

2023 – G20 Digital Economy Ministers Meeting Outcome Statement

2023 – 50-in-5 Campaign

2024 – Global Digital Compact

2024 - DPI Safeguards Framework

2024 –DPI Map, University College London

2024 –Gender Inclusion ID Toolkit, Aapti Institute

2025 –DPI Use Cases Explorer, Co-Develop and Kalpa Impact

2025 - Women's Inclusion for Impact and Scale: Practical Design Guidance for Instant Payment Systems, Level 1 Project

See the prevalence of national DPI implementation on The Digital Public Infrastructure Map.

Bibliography

AnitaB.org India. Website. Available at: https://anitabindia.org/.

Centre for Digital Public Infrastructure (n.d.). "User-Centric Credentialing & Personal Data Sharing." Available at: https://vc.cdpi.dev/.

Centre for Digital Public Infrastructure (2024). "What Is DPI?" DPI Wiki. Available at: https://docs.cdpi.dev/.

Clark, J., G. Marin, O. P. Ardic Alper and others (2025). Digital Public Infrastructure and Development: A World Bank Group Approach. Digital Transformation White Paper, Volume 1. Washington, DC: World Bank. Available at: https://openknowledge.worldbank.org/entities/publication/cca2963e-27bf-4dbb-aa5a-24a0ffc92ed9.

Co-Develop (n.d.). DPI Use Cases Explorer. Available at: https://dpiexplorer.org/.

Co-Develop and DIAL (Digital Impact Alliance) (2024). Digital Public Infrastructure Evidence Compendium. Available at: https://dial.global/wp-content/uploads/2024/11/Co-Develop-Booklet-Digital.pdf.

Digital Public Goods Alliance (n.d.). Digital Public Goods Register. Available at: https://www.digitalpublicgoods.net/registry.

Digital Public Goods Alliance (n.d.). Digital Public Goods Standard. Version 1.1.6. Available at: https://github.com/DPGAlliance/DPG-Standard.

Digital Public Goods Alliance (n.d.). DPG Standard. Available at: https://digitalpublicgoods.net/standard.

Digital Public Goods Alliance (n.d.). DPG4DPI Collection. Available at: https://www.digitalpublicgoods.net/collections/coll-dpi.

Digital Public Goods Alliance (2024). 2024 State of the World's Digital Public Goods. Available at: https://www.digitalpublicgoods.net/state-of-the-worlds-dpg.

Eaves, D., and J. Sandman (2023). "What Is Digital Public Infrastructure?" Co-Develop. Available at: https://www.codevelop.fund/insights-1/what-is-digital-public-infrastructure.

Fetter, J., K. Rao and D. Eaves (2025). 2025 State of Digital Public Infrastructure Report: A Look at Measurement and Prevalence as DPI Transitions from Experiment to Scale. Institute for Innovation and Public Purpose, University College of London. Available at: https://www.ucl.ac.uk/bartlett/publications/2025/nov/2025-state-digital-public-infrastructure-report.

Gates Foundation (2024a). "Could This Be a Transformative Year for Women's Health?" Available at: https://www.gatesfoundation.org/ideas/articles/closing-womens-health-gap.

Gates Foundation (2024b). The Race to Nourish a Warming World. Available at: https://www.gatesfoundation.org/goalkeepers/report/2024-report/.

GSMA (2025). The Mobile Gender Gap Report 2025. Available at: https://www.gsma.com/r/gender-gap/.

Institute for Innovation and Public Purpose, University College of London (2024). Digital Public Infrastructure Map – Global State of DPI. Available at: https://dpimap.org.

ITU (International Telecommunication Union) (2024). "Facts and Figures 2024: The Gender Digital Divide." Available at: https://www.itu.int/itu-d/reports/statistics/2024/11/10/ff24-the-gender-digital-divide/.

Klapper, L., D. Singer, L. Starita and others (2025). The Global Findex Database 2025: Connectivity and Financial

Inclusion in the Digital Economy. Washington, DC: World Bank. Available at: https://www.worldbank.org/en/publication/globalfindex.

Kumar, D., and S. Nauhria (2025). "How Gender-Intentional Digital Infrastructure Can Transform Agriculture." Available at: https://www.weforum.org/stories/2025/09/how-gender-intentional-digital-infrastructure-can-transform-agriculture/.

Level 1 Project (2025). Women's Inclusion for Impact and Scale: Practical Design Guidance for Instant Payment Systems. Available at: https://www.l1p.org/wp-content/uploads/2025/09/L1P-Formatted-FINAL-Womens-Inclusion-Whitepaper-Sept-29-.pdf.

McKinsey & Company (2022). Unlocking Opportunities in Women's Healthcare. Available at: https://www.mckinsey.com/industries/healthcare/our-insights/unlocking-opportunities-in-womens-healthcare.

MyMzansi. Website. Available at: https://www.mymzansi.org.za/.

Office of the Secretary-General's Envoy on Technology and UN Development Programme (n.d.). "Universal DPI Safeguards Framework Visualization." DPI Safeguards Initiative. Available at: https://www.dpi-safeguards.org/framework-visualization.

Office of the Secretary-General's Envoy on Technology and UN Development Programme (n.d.). DPI Safeguards Initiative. Available at: https://www.dpi-safeguards.org/.

Prime Venture Partners (2024). "He Quit His Own Company to Build Aadhaar, UPI, ONDC for India – Dr. Pramod Varma." Available at: https://www.youtube.com/watch?v=devZfUxCI80.

Thoughtworks (n.d.). "Satish Viswanathan, Head of Social Impact." Women at the Table. Available at: https://www.thoughtworks.com/en-au/clients/women-at-the-table.

TinkerHub Foundation (n.d.). Tink Her Hack 3.0. Available at: https://tinkerhub.org/events/ZND99WHAWB/tink-her-hack-3-0.

TinkerHub Foundation (n.d.). Website. Available at: https://tinkerhub.org/.

UN Women (2015). Essential Services Package for Women and Girls Subject to Violence. Available at: https://www.unwomen.org/en/digital-library/publications/2015/12/essential-services-package-for-women-and-girls-subject-to-violence.

UN Women (2022). "Are We on Track to Achieve Gender Equality by 2030?" Data Hub. Available at: https://data.unwomen.org/features/are-we-track-achieve-gender-equality-2030.

UN Women (2024). "Power On: How We Can Supercharge an Equitable Digital Future." Available at: https://www.unwomen.org/en/articles/explainer/power-on-how-we-can-supercharge-an-equitable-digital-future.

UN Women (2025). "Webinar on DPGs4DPI for Gender Justice." January. Available at: https://asiapacific.unwomen.org/en/stories/feature-story/2025/06/un-women-webinar-on-dpgs4dpi-for-gender-justice.

UN Women and UN DESA (UN Department of Economic and Social Affairs). 2025. Progress on the Sustainable Development Goals: The Gender Snapshot 2025. Available at: https://www.unwomen.org/en/resources/gender-snapshot.

United Nations (2015). Transforming Our World: the 2030 Agenda for Sustainable Development. Available at: https://sdgs.un.org/2030agenda.

United Nations (2024a). Global Digital Compact. Available at: https://www.un.org/global-digital-compact/en.

United Nations (2024b). Universal DPI Safeguards Framework: A Guide to Building Safe and Inclusive DPI for Societies. Available at: https://framework-dpi-safeguards.org/frameworkpdf.

UNODC (UN Office on Drugs and Crime) (2024). Global Report on Trafficking in Persons 2024. United Nations publication, Sales no.: E.24.XI.11. Available at: https://www.unodc.org/documents/data-and-analysis/glotip/2024/GLOTIP2024_BOOK.pdf.

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