



Task Force 05

**INCLUSIVE DIGITAL TRANSFORMATION**

## Citizen-centered digital government: Approaches for advancing the public sector's use of technologies based on demand-side data

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## Abstract

The 2023 G20 meeting in New Delhi, India recognized the importance of government measures to improve access to online services. With one-third of the world's population not digitally included, this policy brief proposes a data and demand-driven approach to monitoring, measuring, and policy decision-making related to digital government, to ensure more accessible and inclusive online service delivery. To date, digital government assessments and the decisions to develop online public services have been primarily supply-driven. The needs faced by the intended target users in accessing and benefiting from online public services have often been secondary, resulting in a lack of people using such online services. The gap between the supply and use of online services is anchored in a multitude of issues, including accessibility, affordability, reliability, and skills. Geographical, socioeconomic, and cultural factors, as well as personal attitudes and past experiences with respect to technology and the public sector, can also influence people's propensity for using online services. Therefore, to optimize the benefits of digital government, the demand side requires more attention from decision-makers. This is important to ensure that people can reap the benefits of digital service delivery while guaranteeing that no one is left behind — a key objective of the 2030 Agenda and the upcoming UN Global Digital Compact. In proposing a demand-driven approach, this policy brief analyzes the availability and appropriateness of demand-side indicators. The objective of this policy brief was to enhance data collection and data-driven demand-side analysis while ascertaining the potential need for socioeconomic segmentation to better tailor digital government solutions to citizens' needs. The recommendations aim to optimize the usage and benefit realization of public sector investments in technologies while decreasing potential digital and socioeconomic divides, in line with the G20 priorities.

**Keywords:** Digital government assessments, citizen-centered digital government, demand-side data, Sustainable Development Goals

## Diagnosis of the Issue

Since the 1960s, and particularly with the rapid growth of the commercial Internet since the 1990s, governments worldwide have increasingly used technologies to provide public services. Assessments such as the United Nations E-Government Survey, the World Bank GovTech Maturity Index, the OECD Digital Government Index, and the European Union Digital Economy and Society Index (DESI), have all observed this rapid expansion of online public services, including in the G20 countries.

In this context, the September 2023 G20 meeting in New Delhi, India recognized the importance of government measures to improve access to online services and the need to guarantee that no one is left behind, as specified in the Sustainable Development Goals and the upcoming UN Global Digital Compact. Despite the continuous growth of Internet users worldwide, 2023 International Telecommunication Union (ITU) data showed that 33% of the global population is still offline, with most digitally excluded people located in low-income countries and regions (ITU 2023).

With 65% of women connected compared with 70% of men, the Empowerment of Women Working Group Issue Note for the G20 meeting in Brazil also identified bridging digital gender divides as a priority area. Among the G20 economies, there are notable differences in the use of digital government services between men and women (ITU n.d.). While not all countries have reported data (Figure 1), available statistics have shown that, for example, Canada, Saudi Arabia, and Turkey all experience substantial discrepancies between the genders, with only a few instances of women using digital government services more often than their male counterparts, as seen in France and Russia.

Country	Note	Individuals using the Internet, by type of activity: Getting information from general government organizations				Individuals using the Internet, by type of activity: Interacting with general government organizations			
		Female		Male		Female		Male	
		Value	Year	Value	Year	Value	Year	Value	Year
Argentina	-	-	-	-	-	-	-	-	-
Australia*	-	54.8	2013	56.9	2013	-	-	-	-
Brazil	-	31.6	2022	35.8	2022	29.3	2022	38.5	2022
Canada	Refers to activities conducted on the Internet at home in the last 12 months.	51.7	2009	56.8	2009	78.7	2022	82.1	2022
China	-	-	-	-	-	-	-	-	-
France	-	52.9	2022	50.0	2022	77.0	2016	74.4	2016
Germany	Last 12 months.	52.5	2016	54.8	2016	57.9	2019	59.8	2019
India	-	-	-	-	-	-	-	-	-
Indonesia	-	-	-	-	-	-	-	-	-
Italy	-	35.8	2022	36.7	2022	31.1	2020	33.2	2020
Japan	Includes "Interacting with general government organizations". Last 12 months.	32.0	2022	35.9	2022	2.7	2017	6.3	2017
Mexico	-	21.4	2022	23.5	2022	6.1	2022	7.9	2022
Russian Federation	-	12.1	2013	10.6	2013	16.8	2013	14.6	2013
Saudi Arabia	-	37.3	2019	47.7	2019	52.9	2019	71.9	2019
South Africa	-	-	-	-	-	-	-	-	-
Republic of Korea	-	54.5	2013	58.8	2013	35.7	2013	42.8	2013
Turkey	Last 12 months.	61.8	2021	74.4	2021	65.8	2021	78.1	2021
United Kingdom	Last 12 months.	44.0	2016	45.1	2016	42.9	2020	50.5	2020
United States	-	-	-	-	-	-	-	-	-
European Union*	European Union, 27 countries (from 2020), 16 to 74 years old.	46.9	2021	47.9	2021	57.9	2021	59.1	2021

FIGURE 1: G20 economies, by Internet users' activities involving government organizations. Source: ITU (n.d.).

These inequalities can only be identified and addressed by those countries that collect Internet-related data on supply, demand, and actual use. However, to date, digital government assessments and international benchmarks have mainly focused on the supply side, measuring the application or availability of technologies in and by public organizations.

Access to the Internet alone is not enough to bridge the digital gaps among different socioeconomic groups. Internet users also differ in their digital skills and literacy, which may influence their online activities, including their access to public services through the Internet.

Regarding digital government's user information, data segmentation is essential to facilitate knowledge-based decision-making to address demand-side issues and eliminate digital divides. Geographical parameters such as location and whether areas are rural,

urban, or mixed are also key. Socioeconomic segmentation with respect to gender, age, income, educational attainment levels, and the type and frequency of Internet activities pursued are essential, ideally as a matrix of data to pinpoint the specific groups marginalized (Nielsen 2022). Without such demand-side data, decision-makers cannot identify the extent of the challenges or the contextual issues at play. Subsequent policy priorities, the design and function of online services, and envisioned impacts may be subpar. Likewise, policies addressing digital divides may falter or miss opportunities to maximize impact, as these do not address marginalized communities' primary challenges or needs. Not knowing user profiles with respect to Internet access, online behavior, and skills can similarly result in less citizen-centric service design.

In the context of the 2024 G20 meeting's priority of fighting inequalities, this policy brief underscores the importance of a citizen-centered approach to digital government, one that is based on a data-driven perspective. Although this document focuses on statistical insights, qualitative data is also relevant to that approach.

This policy brief focuses on the use and non-use of digital government, highlighting indicators about the adoption of online services and addressing data gaps related to usage and demand-side data collection. This is particularly relevant for marginalized and vulnerable groups that can face diverse challenges and barriers to accessing online services. The aim is to enhance data-driven demand-side analysis while ascertaining the potential need for, and value of, further user and socioeconomic segmentation of data to better tailor digital government solutions to the needs of citizens. Therefore, making the characteristics of Internet users visible should be one of the critical actions by G20 governments to ensure that digital government is inclusive and no one is left behind in the digital economy.

## Recommendations

### **G20 governments should complement supply-side data with key geographical and socioeconomic statistics for improved decision-making**

To understand the obstacles hindering the adoption of digital government, G20 governments should collect segmented demand-side data for improved analysis of different population characteristics to identify digital inequalities (UN 2022). This can be achieved, for instance, by considering gender variables and data about vulnerable groups (Macaya et al. 2021; Nielsen and Makpor 2021). At present, international indicators often fail to consider local contexts, making it challenging to identify specific populations that are digitally excluded (Nielsen 2022). Indicators gathered by both national statistical agencies and the likes of the International Telecommunication Union (ITU n.d.) and the DESI (European Commission n.d.) already highlight the disparities in Internet use and access to digital government, particularly among men and women and populations in urban and rural areas. However, they lack other types of disaggregated socioeconomic data or local context variables related to geographical location and conditions, age, income, and educational attainment level that can provide a more comprehensive picture with respect to key socioeconomic and digital divides.

### **G20 governments should complement critical geographical and socioeconomic data with sociodemographic data, including locally relevant indicators**

Once critical demand-side data are collected on Internet access and use, G20 governments should complement the demand-side with information concerning other more contextual issues, particularly vulnerable and minority groups, such as data about people with disabilities, race, religion, gender identity, and sexual orientation. In the

context of the G20, a number of countries are already complementing international and national assessments with data on relevant demographic segments, according to their contexts. For instance, Australia has mapped the digital divide between First Nations communities and other Australians (Thomas et al. 2024), while Canada's Internet Use Survey includes a variable related to preferred languages used for online searches (Statistics Canada 2022), making it easier to identify differences in countries with more than one official language or high numbers of immigrants. Therefore, Internet and digital government usage indicators should be available regionally or locally, with information for different segments of society. G20 economies can also analyze sociodemographic data with factors that can create difficulties in or enable the adoption of digital technologies, such as accessibility, affordability, reliability, skills, and capacities. Combining different sociodemographic and socioeconomic data can help address social groups that face difficulties in accessing online public services, as illustrated by Kim and Lee (2024) in their study of online service use among vulnerable groups such as seniors, low-income populations, people with disabilities, and multicultural families in South Korea. The ICT Households survey has been measuring digital government activities by Brazilian Internet users since 2005, highlighting differences among different variables, such as area, region, race, age, and level of education (Brazilian Network Information Center [NIC.br] n.d.). Besides highlighting differences in the usage of digital government, these studies included locally relevant variables that enable addressing public policies for each country according to their context. Collecting, monitoring, and analyzing such data will help identify specific community barriers to accessing digital government, such as access, affordability, skills, service design, etc., particularly for vulnerable groups.

## **G20 governments should collect and analyze the demand-side data related to online activities and behavior for setting digital government priorities and targets**

The G20 governments should examine the demand-side data related to online activities and behavior in general, such as access to websites and apps, searching for information, downloading data or forms, and online transactions. For policymaking and strategic decisions, collecting data with respect to private sector equivalents such as online shopping (or eCommerce), online banking, entertainment such as streaming, gaming, social media use, etc., does two things. First, it provides a monitoring and measurement tool with respect to the digital transformation in general. Second, it enables governments to ascertain the level of access and digital skills overall and with regard to potential targets for digital government. When combined with geographical, socioeconomic, and sociodemographic data, policy and service design decisions could be data-driven and less likely to fail. Examples of analyzing online activities by G20 countries include the DESI, which encompasses data on Europe in many dimensions of usage, including digital skills. In Brazil, the ICT Households survey analyzes the interaction with governments and adoption of other online services, considering the devices used, e.g., exclusive access to the Internet on mobile phones (NIC.br n.d).

## **G20 governments should adopt intersectional analysis in the assessment of digital government services from the demand side**

Ensuring the inclusivity of online public services for all is crucial. To achieve this, governments must analyze data on the use of online services at different levels of disaggregation and examine the potential inequalities concurrently (Nielsen 2022). Intersectional analysis is critical to this process, and G20 governments should consider it from the beginning of the implementation of digital government services by collecting



and analyzing various data on users and non-users. For instance, Macaya et al. (2021) demonstrated how analyzing gender and other socioeconomic data together can reveal vulnerabilities for specific groups in Brazil. They found that black women face more barriers to using digital government services compared with black men. Similarly, Goggin and Soldatić (2022) shed light on the implications of automated decision-making in the public sector for Indigenous Australians with disabilities, underscoring the necessity for more up-to-date and regular data on people with disabilities and digital divides. Studies like these emphasize the need for more data about specific socioeconomic and sociodemographic groups to address public services targeted to them.

**G20 governments should use automatic and non-conventional mechanisms to collect machine- and citizen-generated data to identify citizens' needs to adopt digital government**

The global multiplication of sensors linked to mobile phones, the Internet of Things (IoT), CCTV cameras, drones, and satellites are all generating an unimaginable volume of very rich data on the physical and social environment. For instance, national telecommunication regulators in many countries have access to data on telephone and Internet subscriptions because they require proof of identity to access such services (GSMA, 2021). Organizing such data by socioeconomic and sociodemographic characteristics would enable governments to assess the actual penetration of technologies. Combining these data with actual Internet use based on anonymized GPS locations would enable, for example, the creation of heatmaps on actual online behavior and assessment of the degree of digital exclusion. To capture such data, partnerships with the telecommunication sector are key and can be facilitated through telecom operation and licensing agreements. Naturally, data privacy must be respected, so anonymization and

ethical management of the data are essential to adopting this type of demand-side analysis.

In addition, the machine-generated data can be further enriched with government socioeconomic data on both income levels and educational attainment levels. Likewise, citizen-produced data that users generate through the use of their mobile devices (smartphone holders as “innovative sensors”) and while using social media and blogs can give governments a better understanding of “citizens’ behaviors” regarding public service delivery (OECD 2017). Combined, these machine- and citizen-generated data offer governments a good understanding of how citizens use the available government services and provide information about citizens’ interest in new and different government services. Governments must take advantage of this data to develop new and creative approaches to understanding and improving how they deliver inclusive and effective services to citizens. To fully exploit the value of these relevant multi-source, non-conventional data sources, the use of filtering, searching, and data analytic tools, Artificial Intelligence (AI), and other technologies is recommended. Governments must consider establishing technical platforms and enhancing capacities to conduct this type of processing. In sum, G20 governments should improve their ability to better understand citizens’ needs by combining demand-side data with automatic and non-conventional data collection methods.

## Scenario of Outcomes

This policy brief aims to propose a data-driven approach anchored in demand-side data for improved monitoring, measurement, and policy decisions related to digital government. The ultimate aim is to enhance accessibility, usability, and inclusiveness for online service delivery in particular and actively strive to eliminate digital divides. Collecting and analyzing demand-side data for digital government is essential to designing targeted and effective public services. Having a better data-based understanding of the diversity of citizens helps in the formulation of policies and guides decisions based on “inclusion by default” and “hybrid by default” principles of digital government initiatives, as highlighted by the 2022 United Nations E-Government Survey. In this context, governments should understand how “online” and “offline” government services affect different population groups and whether their decisions may exacerbate exclusion or discrimination.

However, data collection is costly, and increased segmentation is not negligible. Therefore, the G20 governments should explore alternative models for data capturing and analysis while investing in cost-effective technologies and tools to automate data collection and processing.

Access to other types of data sources, such as telecom data, can be difficult. Governments need to collaborate closely with other diverse stakeholders, including the private sector and international organizations, to ensure they have access to necessary data sources to inform their digital service delivery. In addition, governments need to make sure they have appropriate data-sharing agreements and policies in place to ensure people's privacy and data protection, particularly when analyzing sensitive data or people's information that can lead to discrimination or exclusion.

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