E-government for leaving no one behind

2.1. Introduction

Addressing the needs of the poorest and vulnerable groups is one of the building blocks of resilient and sustainable societies. Given today's complexities – from humanitarian crises and migration patterns to the challenges of the urban and rural poor – technologies offer an opportunity to leave no one behind by extending the reach and access of information and services to those who need them the most.

At the 72nd Session of the United Nations General Assembly, a new agenda item on the impact of rapid technological change on the achievement of the Sustainable Development Goals (SDGs) underscored in a resolution the persistent and growing digital divides in science and technology among and within developed and developing countries. The text also addresses the issues of ensuring an inclusive and gender-sensitive approach and promoting the empowerment of women and girls[1]. It is widely agreed by countries that inclusiveness speaks to the notion of empowerment and the principle of non-discrimination and is reflected in the pledge to leave no one behind.[2] There is similarly a broad accord in the Addis Ababa Action Agreement[3] on the need to create a transformative framework that contains concrete deliverables, and to craft a cohesive strategy ensuring parity in data access and use across regions. World leaders agree that strengthening cooperation in technology, infrastructure and social protections to drive prosperity is key to realizing inclusive and sustainable development.

Social and digital exclusion are interlinked as research has shown that differing access to technology contributes to socio-economic stratification or inclusion.[4] It is therefore imperative that e-government is recognized as an incentive to bring more people online. E-government enables people with access to take advantage of digital government information and services and stimulates greater social inclusion through the use, for example, of online and mobile financial services. The *2014 United Nations E-Government* noted that digital divides are "inextricably linked to a lack of social equity in today's information world." In an increasingly digital world, electronic inclusion, or e-inclusion, is fundamental to leaving no one behind.[5] The rapid development of E-Government has created new imperatives for policy-makers to bridge social gaps through greater e-inclusion in terms of access and usage.

Digital divides[6] are no longer considered to be only a lack of access to ICT infrastructure. Neither are they necessarily a division between high- and low-income countries. Given the progress of e-government, digital divides exist in all countries, and they must be bridged to enable

Photo credit: pixabay.com

In this chapter:

everyone to take full advantage of what the digital society is offering. A lack of e-inclusion could put vulnerable populations at risk of falling further behind. Many of the 67 principles adopted at the 2003 United Nations World Summit on the Information Society directly acknowledge that point, including principle 10, which states:[7]

> "We are also fully aware that the benefits of the information technology revolution are today unevenly distributed between the developed and developing countries and within societies. We are fully committed to turning this digital divide into a digital opportunity for all, particularly for those who risk being left behind and being further marginalized."

Global efforts to bridge access to the Internet are improving. Almost one-half, or 48 per cent of the world's population, is estimated to have used the Internet in 2017.[8] At the same time, there are large regional differences. In Europe, almost 80 per cent of the population used the Internet. The Commonwealth of Independent States (68 per cent) and the Americas (66 per cent) followed as the only regions where more people use the Internet than do not. In Africa, only 22 per cent were estimated to use the Internet in 2017, leaving the continent lagging all other regions.

Figure 2.1.   Individuals using the Internet

Source: ITU
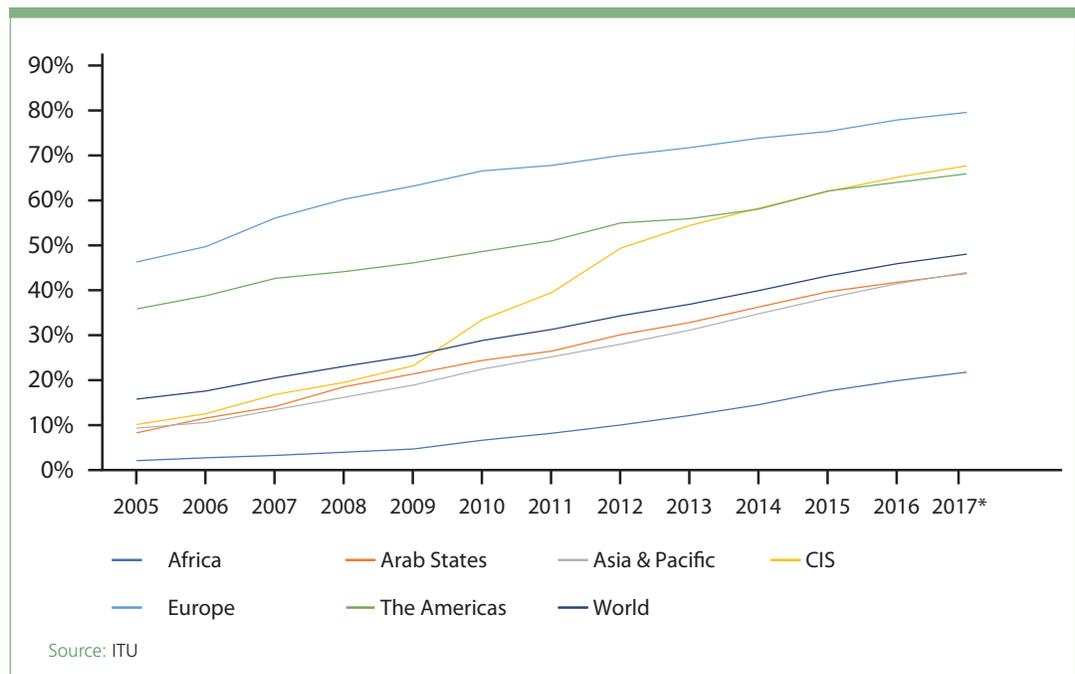
Mobile devices are proving to be helpful in bridging the access divide. Fixed- and mobile-broadband prices are falling, making ICTs more accessible and affordable. In 2017, mobile-cellular telephone subscriptions were estimated at 103.5 per 100 inhabitants, of which 56.4 had an active mobile-broadband subscription providing Internet connectivity (*see figure 2.2*). There remain, however, large discrepancies between developed and developing countries. In the former, mobile-cellular subscriptions are approaching 127.3 per 100 inhabitants (as one person can have more than one subscription) while the number for developing countries is 98.7.

The rapidly increasing use of mobile devices around the world elevates the potential for mobile government (mgovernment) services as a subset of e-government. Mobile services and smart phones allow governments to better reach the poorest and most vulnerable. As a result, 74 countries have

Figure 2.2.   Mobile subscriptions in developed and developing countries

Source: ITU
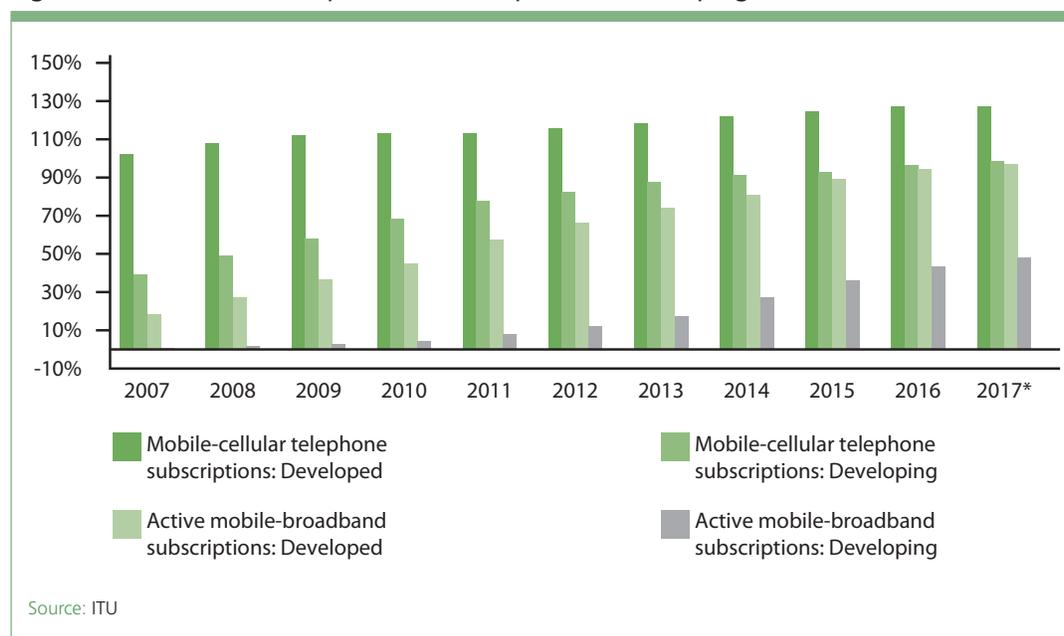
dedicated mobile apps to deliver online services.[9] Moreover, 83 countries indicated that they are providing some form of mobile service through short message service (SMS), mobile apps or the equivalent.

Despite this progress, most of the world's population remains offline. This increases the risk that vulnerable groups without Internet access will fall further behind in an increasingly digital society. While those online are benefiting from ever improving e-government services such as e-health and eeducation, those without access are being excluded from such opportunities. Bridging digital divides, therefore, is important for ensuring that no one is left behind in taking advantage of socio-economic opportunities. An additional benefit of greater e-inclusion is cost savings for governments themselves as people move from offline to online channels. The UK Government Digital Efficiency Report found that digital transactions were 50 times cheaper than face-to-face ones[10] (*see figure 3*). Such cost-savings could enable additional investment in bringing people online in the first instance or provide technology solutions in other areas of e-government.

Figure 2.3.   Channel vs relative cost unit

Channel	Relative cost unit
Digital	1
Telephone	20
Post	30
Face to Face	50

Source: UK Government Digital Efficiency Report

However, the adoption by governments of emerging technologies such as artificial intelligence (AI), blockchain, cloud computing, big data and analytics, may inadvertently create new divides. This heightens the need for governments to create appropriate policies and regulations to stimulate adoption of emerging technologies among civil society and the private sector which would improve inclusion without widening existing divides. In addressing the pledge to leave no one behind,

e-government is clearly at the centre of the 17 Goals and 169 targets of the 2030 Agenda for Sustainable Development.[11]

This chapter focuses on digital divide barriers to e-service delivery at the national level, including among persons with disabilities, older persons, women, youth and other vulnerable groups, and seeks to enhance understanding of the opportunities available to bridge the gaps. The 2018 Survey questionnaire includes a set of questions assessing the digital divide in e-government development (*see Survey Methodology*). All data used in this chapter come from that questionnaire, unless otherwise stated. This chapter also provides an overview of various digital divides with the aim of identifying the obstacles to greater digital adoption. Finally, it illustrates how e-government can be used to improve digital inclusion to benefit all citizens.

2.2   E-service delivery

There has been notable progress recently in e-services aimed at disadvantaged and vulnerable groups. According to the Survey, the number of country websites with information about specific programmes and initiatives to benefit women, children, youth, persons with disabilities, older persons, indigenous peoples, people living in poverty, or other vulnerable groups and communities, has been increasing steadily since 2012. According to the United Nations Member State Questionnaire, 80 countries out of 100 indicated that they provide specific measures to ensure egovernment use by the most vulnerable segments of their population in 2018, up from less than 30 per cent in 2012. To track progress, 64 of those respondents said they collect usage statistics in this area.

Figure 2.4.   Number of country websites with information about specific programs/
initiative to benefit vulnerable groups and communities
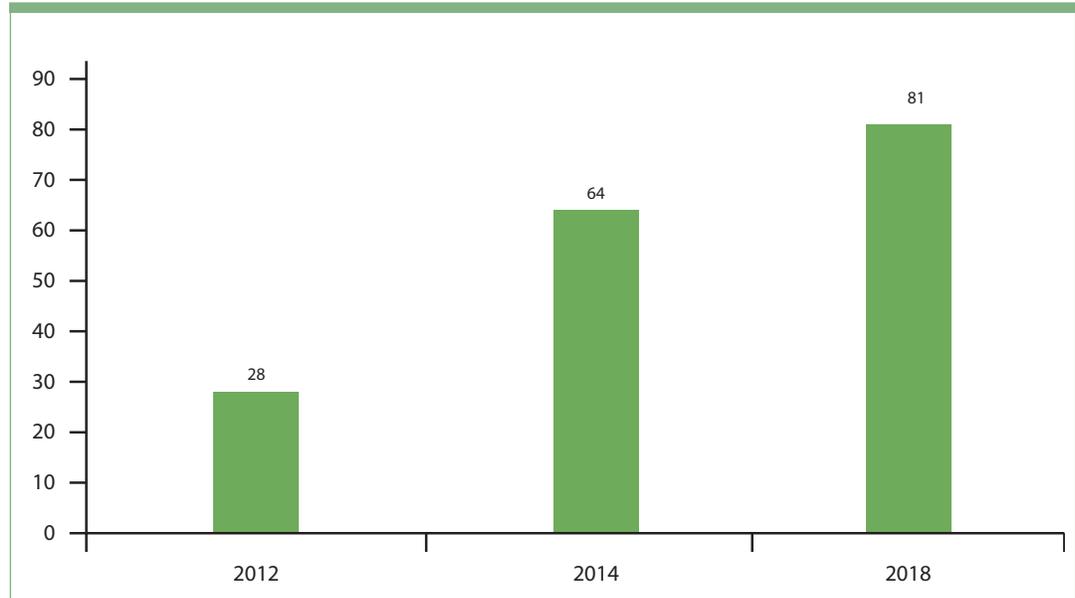
Great emphasis is being placed on m-government services in delivering remote education, health and other social services, which impact positively on people's everyday lives. This is particularly true for those in rural areas who have been previously at a disadvantage compared to their urban counterparts. Notably, m-government provides the same opportunity in interacting with public authorities and possibly limiting corruption in the process.

Figure 2.5. Number of countries with specific online government services available to vulnerable groups
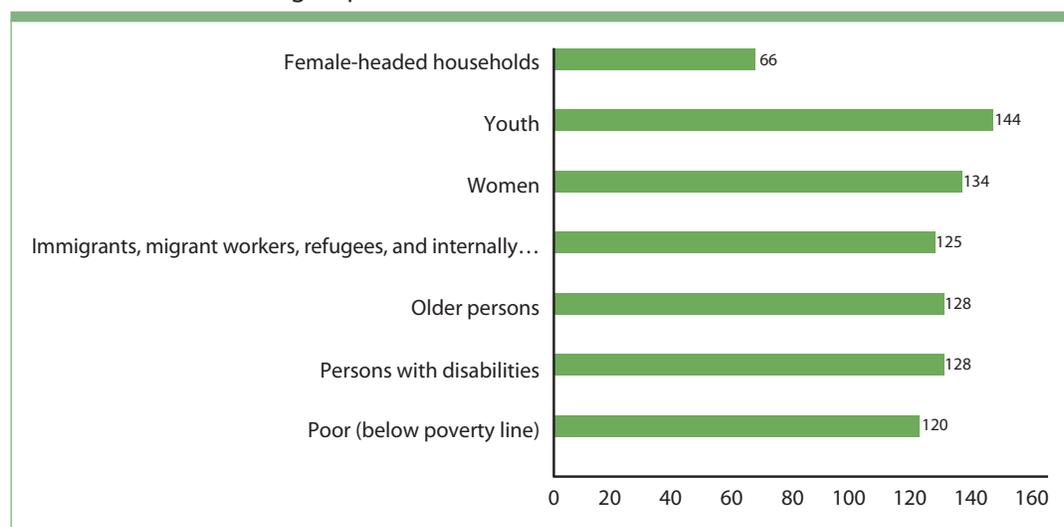
Box 2.1. Mexico: Automated SMS communication nudges users towards healthy habits

Despite the Government's commitment to maternal and child health, Mexico has continued to lag in maternal mortality, under-five mortality and childhood stunting. To improve its reach to its citizens to influence their health decisions, the Government created the Prospera Programme, the second largest conditional cash transfer programme in the world, which provides cash to approximately 7 million families with a per capita monthly income below the minimum welfare line (USD $55 for rural areas and USD$ 85 for urban areas).[12]

The Government partnered with the United Nations Children's Fund (UNICEF) Mexico to launch Prospera Digital, a pilot randomized controlled trial (RCT), based on behavioural science principles that tested targeted messages using an open source communications platform. The service simulates conversation by sending automated Short Message Service messages; it analyses responses and replies accordingly. Each message addresses the specific needs of the end user and improves the Government's ability to respond effectively. The programme is designed to help women through pregnancy and during the first two years of their babies' lives.[13]

The pilot was launched in December 2015, and it has since been used by more than 5,000 women. Evidence suggests that Prospera Digital is having the desired impacts on promoting overall maternal and childhood health. The programme is increasingly perceived as a "trusted partner", with response rates during pregnancy at above 60 per cent.[14] By the end of 2018, the Government is planning to launch a national version of the programme that will include modules to educate and promote healthier behaviour around other health issues such as diabetes, hypertension and obesity.

Source: https://www. gob.mx/prospera

Emerging technologies are also enabling governments to improve e-service delivery and to adapt to shifting needs. Drones, for example, are being used to deliver services to remote areas at a lower cost and faster pace. In Africa, that potential is being applied across a wide range of areas, from agriculture to health care.[15] (*see Box 2.2. on the use of drones to improve health care in Rwanda*).

Artificial intelligence (AI) is also improving the efficiency of service delivery to marginalized groups. In the Middle East, the United Arab Emirates is on a path to make the country a leader in AI. In October 2017, the country created a strategy for AI and appointed the world's first Minister of State for AI. Civil society is also increasingly looking to emerging technologies to provide greater assistance to the public.[16]

Box 2.2.   Rwanda: Drones to improve health care

In 2016, the Rwandan government signed a partnership with Zipline, an American drone company, to cut delivery time of medical products to remote areas.[17] Whenever a hospital needs blood, they simply send a WhatsApp message or place an order online, after which they receive a confirmation that delivery is coming. When the drone is within a minute of its destination, an SMS message is sent informing the doctor that the drone will soon dispatch the package through a parachute.

Previously, it took about four hours to deliver life-saving services such as blood to rural hospitals. But with a drone, deliveries are now being completed in less than 45 minutes, and in some cases, in as little as 15 minutes. The partnership between Rwanda's Ministry of Health and Zipline has delivered more than 5,500 units of blood, and once the programme is established nationwide, it is expected that the costs will be comparable to current deliveries made through land vehicles but with a much quicker response time.[18]

This is not the first time an East African country is spearheading emerging technology solutions aimed at greater inclusion. In 2007, Safaricom, a Kenya-based telecommunications company, launched the often-cited mobile phone-based money transfer service, M-Pesa, which has since spread around the region and the world. That success is now being replicated with drones. In early 2018, the Tanzanian government looked to replicate the efforts in Rwanda.[19] It is now setting to open four drone distribution centres with Zipline, which will provide more than 100 drones and 2,000 flights a day.

Source: https://www.moh.gov.rw

2.2.1. Digital identities

Today an estimated 1.1 billion people worldwide—mostly people living in poverty, migrants, refugees, those in rural communities and other disadvantaged groups—have no legal identity.[20] Sustainable Development Goal 16, specifically Target 16.9, seeks to remedy that by 2030. Providing legal identities to these vulnerable group can help by expanding financial inclusion and preventing fraud and corruption in the delivery of social services (*see Box 2.3. on digital financial inclusion initiatives in Bangladesh*). Digital identities have been offered as a means to expedite the process effectively.[21]

In 2014, the Peruvian National Registry of Identification and Civil Status (Registro Nacional de Identificación y Estado Civil (Reniec)) established the national electronic identity document (DNIe). The DNIe integrates two digital certificates, one of which enables the cardholder to sign electronic documents with the same validity as hand-written signatures. The electronic ID provides access to all public digital services, for example, electronic voting or processing certified copies of official acts with full legal value.[22] The identification system has been recognized as one of the best in Latin America.[23]

In India, the Aadhaar program is providing digital identity to the entire population and is serving as the basis for interacting with the Government at various levels. Aadhaar captures a biometric profile consisting of an iris scan, finger prints and a photograph. Most Indian States have now enrolled more than 80 per cent of their residents.[24]

The opportunities to create digital identities are further enabled by high mobile penetration rates. Most mobile operators are now mandated to verify the identification of users when they register a mobile SIM (subscriber identification module) card and now have "know-your-customer" (KYC) obligations for mobile financial services. This provides a unique opportunity for governments to increase digital identity registrations and improve socio-economic outcomes. For instance, mobile operators are now involved in birth registration systems in the United Republic of Tanzania, Uganda, Ghana Senegal and other countries.[25]

Box 2.3.   Bangladesh: Digital financial inclusion initiatives

The rural poor in Bangladesh are still facing many barriers when trying to access the formal financial system. Financial inclusion programmes focused on branch-based banking have failed because rural villagers deal mostly in cash, and the transaction expenses are prohibitively expensive. In response to the difficulty of building bank branch networks, the Central Bank began promoting inclusive digital financial programs in 2015.[26]

Digital Financial Services (DFS) Lab+ is a joint initiative between the Central Bank and Access to Information (a2i), a digital inclusion programme under the Office of the Prime Minister. DFS studied the Unique Identification Authority of India (UIDAI), which enrolled over 1 billion people in five years using biometric information such as fingerprints and iris scans.[27] DFS research showed that beneficiaries in Bangladesh could save as much as 58 per cent in time, 32 per cent in cost and 80 per cent in the number of visits if government safety net payments were digitized.[28]

The Digital Financial System is collaborating with the private sector and civil society in offering agent banking and mobile financial services in more than 1,900 Digital Centres across the country.[29] The Digital Centres are one-stop shops, mainly in rural areas, which provide access to Internet, e-government services and ICT training. DFS aims to increase payment digitalisation, assisted e-commerce, account usage and financial literacy among poor farmers in rural villages, especially in the remote pockets of Bangladesh.[30]

Source: http://a2i.pmo.gov.bd/digital-financial-services/

At the same time, such opportunities highlight the challenges that a lack of e-inclusion can bring to those who remain offline. As more people gain digital identities and are able to take advantage of socio-economic opportunities, those who do not have one risk falling even further behind.

2.2.2.   E-participation

The concept of leaving no one behind extends to inclusive digital participation. The use of online tools can enhance access to information and public services, as well as promote better public policy decision-making (*see chapter 5 for further details*). E-participation can serve as a catalyst for citizen engagement and in achieving the objectives of the 2030 Agenda.

The Crystal Urn initiative in Colombia (Urna de Cristal) was created by the Colombian government to increase citizen participation and government transparency.[31] The programme allows citizens to ask questions, access information, and participate in policy consultation exercises. Citizens can access the Crystal Urn website or use social media. Those without access to the Internet can also participate through radio, call-centres and SMS. For example, in December 2017, the National Planning Department conducted a consultation about food supplements in schools via SMS, sending approximately 315,000 messages and receiving nearly 31,000 responses.[32] In 2017, the programme received an honourable mention by the Ministry of Public Functions for the national senior management award (Premio Nacional de Alta Gerencia).

The opportunity to gain access to more information and participate in online engagement with their government can also serve as a stimulus to bring more people online for public engagement. For example, if vulnerable populations feel that their voice is heard through e-participation, they might be more likely to go online, and more frequently. This in turn could increase utilization of other e-government services, as users, once online, may discover the benefits of other online public-sector services. Simultaneously, those who remain offline or do not have the skills to use e-participation may feel even more excluded from public discourse, yet another reason to tackle multiple digital divides.

2.3 Digital divides

The "digital divide" was once considered to be a lack of access to the Internet and hardware, such as computers, phone, and mobile devices. But access has improved through technological progress and affordability, such as access to mobile phones. However, new digital divides have emerged, such as the speed and quality of those devices, and in digital literacy or the know-how to use them. Hence, the debate has moved from "a" digital divide to "multiple" digital divides," which are not only a global challenge but also local contextualized problems in terms of availability of content, bandwidth, and skills, among other issues. The WSIS+10 General Assembly resolution recognized this distinction.[33] Table 2.1 shows a selection of digital divides.

Table 2.1.   A selection of digital divides – from access to useful usage[34]

Divide	Description
Access	It starts with access or the lack thereof: although Internet penetration has increased, it continues to be a key barrier as more people globally remain offline rather than online
Affordability	The gap between rich and poor affects affordability of ICTs and serves as an important difference in adoption within countries as much as between them
Age	Older people are generally using ICTs to a lesser extent than younger populations, despite the notion that they could benefit from online social and health services
Bandwidth	International bandwidth and the capacity to transmit and receive information over networks varies greatly between countries but also within them, limiting potential useful endeavours
Content	Relevant content in local language(s) is important to stimulate adoption
Disability	Those with disabilities face additional hurdles to use ICTs if websites are not compliant with web accessibility guidelines
Education	Like social divides, education and literacy rates are fundamental challenges to bridge digital divides
Gender	There is a small but persistent difference in online usage between men and women
Migration	Migrants may not possess the same levels of digital skills as the population in their new country and if they do, may be subject to content and language divides
Location	Rural and remote areas are often at a disadvantage in terms of speed and quality of services as compared to their urban counterparts
Mobile	Mobile devices provide opportunities to bridge the access gap but can also introduce new forms of divides in terms of technology, speed and usage
Speed	The gap between basic and broadband access is creating a new divide as speed is important to reap the full benefits of a digital society
Useful usage	What people do with their access is a key difference in whether users take full advantage of ICTs, such as e-government services

Note: The above table is intended to be illustrative and not exhaustive

Strategies tackling digital divides implicitly mean greater dependency on ICTs generally and with respect to e-government specifically. Such dependency may have unintended consequences and create new digital divides. A combination of gross national income (GNI) per capita as a proxy for socio-economic opportunities, and Internet usage as a reflection of the digital society, highlight the degree of digital dependency. Such a matrix of GNI and Internet usage can help countries identify emerging

digital divide challenges by looking at countries ahead of them in the digital development.[35,36,37] For example, countries with low GNI and low Internet usage often face an infrastructure challenge whereas Member States with high numbers often struggle with bringing the last proportion of the population online to avoid leaving those people further behind.

There have been numerous attempts to measure various aspects of digital divides considering the importance of e-inclusion. Research shows that lower-income families, those with less education, persons with disabilities, minorities, and rural residents generally lag behind in both broadband adoption and computer usage.[38] Recognizing the multitude of digital divides today, the need for "useful usage," a term coined to describe the difference between access and what people do with it, surfaces as a key difference-maker in terms of whether people can take advantage of e-government services, which also requires investment in developing digital skills.[39]

Collection of data and statistics related to all digital divides should therefore be enhanced, especially given technology progress. Currently, countries mainly track information on traditional yardsticks of digital divides such as access to technologies rather than delving into the underpinning factors that prevent usage of available e-government services, such as lack of local content or web accessibility conformance. Governments indeed face a tall order in bridging numerous digital divides depending on where they find themselves in their digital development: from upgrading basic infrastructure and promoting the benefits to all - including women - to addressing new challenges, such as web accessibility and digital first.

2.3.1. Infrastructure divides

To reap the full benefits of e-government moving forward, high-speed broadband access and greater bandwidth are necessary components. Although both fixed- and mobile-broadband subscriptions have increased significantly around the world, the proportion of people who do not have access continues to far outnumber those who do.[40] Lack of access remains a particular problem in low-income countries where in 2016, only 12 out of every 100 people were Internet users, according to the latest data available.[41] The middle-income countries rated higher in terms of having more Internet users - about 42 people per 100 - although a majority of their populations remains offline.

Mobile connectivity was once considered a unique opportunity to bridge access divides, but countries are increasingly realizing the importance of fixed-line infrastructure to enhance e-inclusion and equal opportunity for all. This is made even clearer with the introduction of 5G mobile networks which require fibre networks. Governments around the world are formulating a wide variety of plans to bridge the connectivity divide. Countries with a clear broadband strategy are also credited with a higher penetration rate than those without a plan.[42] There are, however, big differences in funding capacities and national approaches.

Contrary to notions of leapfrogging into mobile-only solutions, emerging markets are also investing in fixed-line broadband networks. In India, for example, the government created the National Optical Fiber Network in 2011 to connect all 250,000 villages (Gram Panchayats) with fixed-line broadband.[43] European countries, such as France, are focusing government investment almost entirely on rural areas, in part due to European Union funding guidelines preventing support for urban areas where private sector operators are investing. In Australia, the Government is building and funding a national broadband network combining fixed, mobile, and satellite connectivity.[44]

The quality and speed of mobile connections must also increase to reap the full benefits of connectivity. The rapid rise of mobile adoption in emerging markets is proving helpful in bridging the connectivity divide. However, network quality and speed remain a challenge if economies want to reap the benefits offered by transferring greater amounts of data over mobile networks. The population covered by a 3G network—considered the minimum speed required for "smart" data functions—remains at 85 per cent globally.[45] However, next-generation networks, such as 4G mobile-broadband subscriptions, are lagging behind.
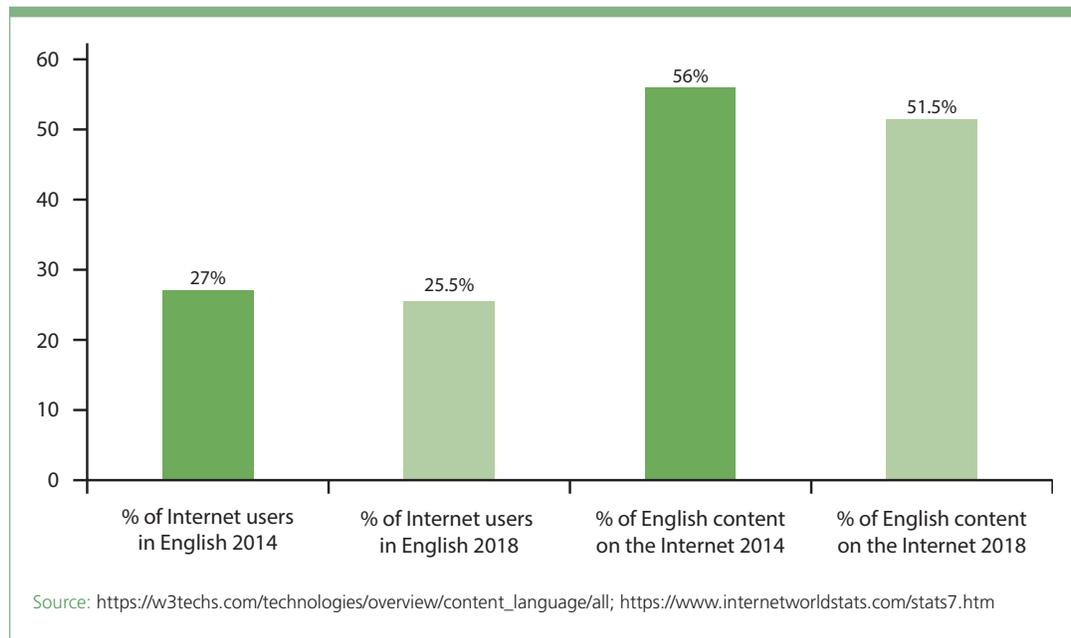
2.3.2. A perceived lack of benefits

Lack of Internet connectivity and usage can also stem from a lack of perceived value. In the United States, according to a 2013 report from National Telecommunications and Information Administration, about one-half of those who do not use the Internet say they are just not interested.[46] More recent research from Brazil similarly reveals that 7 in 10 people show a lack of interest or skills to go online.[47]

Those findings highlight the need for local services to meet local needs. For example, rural Chinese farmers can purchase new agricultural products, but there may be a lack of information in the local language on how to use them.[48] Similarly, in India, a country with 26 languages, finding content in the local language is a big challenge.[49] The trend of declining proportions in English-speaking users and content is not absolute but rather reflect the rise in online usage among non-English speaking countries (*see Figure 2.6*). Despite progress, providing local, relevant and useful content, in addition to raising awareness about it, requires significant effort.

While the mechanisms for providing e-government services to vulnerable groups vary, providing e-services through partnerships tend to reach more vulnerable groups more effectively. Multi-stakeholder partnerships with the private sector and non-governmental organizations are helping governments find innovative solutions to addressing traditional problems related to poverty and social exclusion. They can expand access to e-government and help develop dedicated services targeted at vulnerable groups.

Figure 2.6.   English language dominance

Source: https://w3techs.com/technologies/overview/content_language/all; https://www.internetworldstats.com/stats7.htm

Successful examples of local content are often linked to economic incentives. In the South Indian province of Kerala, fishermen are using their mobile phones to get price information on what different markets would pay for their catch. This demonstrates the clear benefits of mobile usage, as the fishermen's profits improved by 8 per cent.[50]

2.3.3. A gender divide

Cultural or social acceptance of Internet use, particularly for women, is another aspect of the connectivity divide. ITU research finds that a woman in the developing world is 21 per cent less likely to own a mobile phone.[51] In 2013, the Broadband Commission for Digital Development established a target calling for gender equality in access to broadband by 2020.[52] In 2017, about 51 per cent of men globally were online compared to about 45 per cent of women.[53] One reason may be a lack of supply-side content targeting women (*see Box 2.4. on case study on Asia-Pacific*). For example, according to Oncology Services International, about one-third of Member States, or roughly 74 countries, do not provide information about reproductive health-care services.

Box 2.4. Asia-Pacific: E-government for women toolkit

Research shows that globally there are fewer women than men online.[54] That gender divide raises concerns regarding e-inclusion generally and the opportunity to take advantage of e-government specifically. In response, several global organizations, such as the International Telecommunication Union (ITU), have embarked on promoting greater Internet access for women, including awareness-raising events such as Girls in ICT Day.[55]

In this context, the United Nations Department of Economic and Social Affairs (UN DESA), Division for Public Institutions and Digital Government (DPIDG) through its Project Office on Governance (UNPOG), and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) jointly launched the EGov4Women Toolkit (https://egov4women.unescapsdd.org/toolkit) in early 2018. The toolkit is a set of five training modules that promotes e-government that bridges gender divide and aims for social inclusion. This online platform is an innovative public resource related to the design and implementation of gender-responsive E-Government institutional ecosystems in the Asia-Pacific region. The toolkit represents the first region-wide toolbox to support the gender-mainstreaming of E-Government. Through a set of 5 comprehensive modules, it provides key pointers for policymakers on gender-responsive design of e-service delivery, e-participation and connectivity initiatives, and introduces a capabilities-based approach to outcome evaluation of E-Government for women's empowerment.[56]

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Source: https://egov4women.unescapsdd.org/toolkit

Another reason cited for lower Internet use among women may be the lack of content geared towards them. According to the Online Service Index, approximately one-third of United Nations Member States do not provide information about reproductive health-care services, for example.

Efforts to promote female inclusion from a demand-side perspective are under way. In South Africa, for example, Lwazi, an initiative of the Department of Telecommunications and Postal Services, helps victims of gender-based violence learn how to leverage ICTs to reduce the digital skills gap for women.[57] The programme teaches ICT skills, such as basic coding and entrepreneurship, to interested women and girls, and encourages them to use ICTs to combat the social challenges facing them.[58] In Malaysia, the "Digi Wanita Era Digital (DigiWED)" nationwide initiative – a public-private partnership between Digi Telecommunications (Digi), the Malaysian Communications and Multimedia Commission (MCMC) and the National Council of Women's Organizations (NCWO) – is seeking to educate and integrate women into the online community. DigiWED is using the 1Malaysia Internet Centers to conduct basic ICT training and to introduce women to safe usage of smart devices and the Internet.[59]

2.3.4. Web accessibility

Persons with such disabilities as sight impairment are often excluded from access because most websites are not adequately designed to handle technologies such as screen readers.[60] People who rely on screen readers to read the content of websites, also rely on websites to be properly designed[61]. Such barriers hamper use of e-government services, among others. In Europe, for example, 49 per cent of individuals used the Internet for interaction with public-sector authorities in 2017.[62] Yet, only one-third of Europe's government websites are fully accessible to persons with disabilities.[63] In the 2018 Survey, only 76 UN Member States were fully compliant with web accessibility standards, according to an automated test, leaving much room for necessary improvement.[64]

One challenge to web accessibility has been a lack of regulation or monitoring. In Norway, a new law mandates that both public- and private-sector websites should be web accessible, but implementation appears uneven.[65] The web accessibility gap is being bridged primarily by civil society and private-sector entities looking for a competitive edge in attracting customers. For instance, the World Wide Web Consortium creates standards for web accessibility.[66] This is helpful to users with disabilities but can be difficult to monitor effectively. This is among the reasons for the European Commission's Directive on the accessibility of public-sector websites and mobile applications that not only impose compliance with accessibility requirements but also require that they be monitored on a regular basis.[67]

2.3.5. Digital first

The digital divides become more apparent as an increasing number of government services are provided online. By promoting a "digital first" approach, governments may inadvertently create new digital divides by excluding those who cannot use online services. Thus, supplementing online services with technology-enabled offline services is increasingly important as countries move towards adopting a more digital government with the aim of promoting efficiency and inclusiveness. To leverage digital use, some countries are making services "digital by default" designed primarily for use online but when some services are not available offline, the potential implications are significant.

Denmark has taken a "digital first" approach where electronic interaction is now legally mandatory. Help is available offline to those who are unable to complete the transactions themselves. Similarly, the United Kingdom has developed digital assistance initiatives. To measure progress, the Government is using a performance-tracking dashboard for service managers, which enables them to track service usage on both digital and non-digital channels.[68] For instance, in processing driving license renewals, the dashboard shows the number of digital transactions taking place, with data breakdowns by device, such as desktop, mobile, or table, and user satisfaction.[69]

The public sector is inadvertently creating new digital divides by advancing e-government services at the expense of those who cannot take advantage of them. A survey by Go ON UK[70,71], a non-governmental organization (NGO), and the British Broadcasting Corporation found that one in five, or 21 per cent of the population in the United Kingdom do not have the skills or ability to communicate via email, use a search engine or conduct transactions online. There are non-technology related measures that could ensure that e-government benefits reach those who are the furthest behind. It is important that governments use various communication mediums such as call centres and community centres to serve vulnerable groups.

2.4   Digital literacy

It is widely recognized that digital skills can help improve social inclusion. Thus, these skills should be taught to schoolchildren and enhanced among civil servants, the private and public sectors. Additionally, digital assistance initiatives should be spearheaded to support members of society who are unable to access online services themselves. Underpinning these efforts is the aspiration to meet the evolving needs of citizens and businesses.

In Singapore, the Government has established programmes, such as the Silver Infocomm Initiative (SII), bridging the connectivity divide for older people by addressing their lack of education or digital skills, where it exits.[72] The European Union Commission has noted that improving digital skills among public-sector servants is vital to reaping the benefits of e-government.[73]

### Box 2.5.   Portugal: Citizen Spots combat the digital divide

In 2014, the Portuguese Agency for Administrative Modernization launched the Citizen Spot initiative, a helpdesk with specialized attendants delivering services related to both public administration and the private sector. The programme targets those who are not comfortable in an online environment. Citizen Spots provide face-to-face support by trained civil servants or private attendants who guide citizen-clients in obtaining online services. The human interaction facilitates online use, teaches digital literacy, and aims to reduce the digital divide. The Agency aimed to launch 1000 Citizen Spots by 2016, and provide coverage to all 278 municipalities in mainland Portugal.[74]

In 2017, there were 533 Citizen Spots, offering approximately 200 public services.[75] They are mainly located in town halls, parishes or post offices.[76] Implementation has been slower than expected. But despite the delays in building out the network, the initiative has been successful in reducing costs due to maximizing the usage of existing resources and cost-sharing between the public and private entities that share the responsibilities of operating the Citizen Spots.[77] Citizen Spots have been used approximately 320,000 times since implementation.[78]

Source: https://www.portaldocidadao.pt/home

Figure 2.7.   Educational access

Source: 2018 UN E-Government Survey
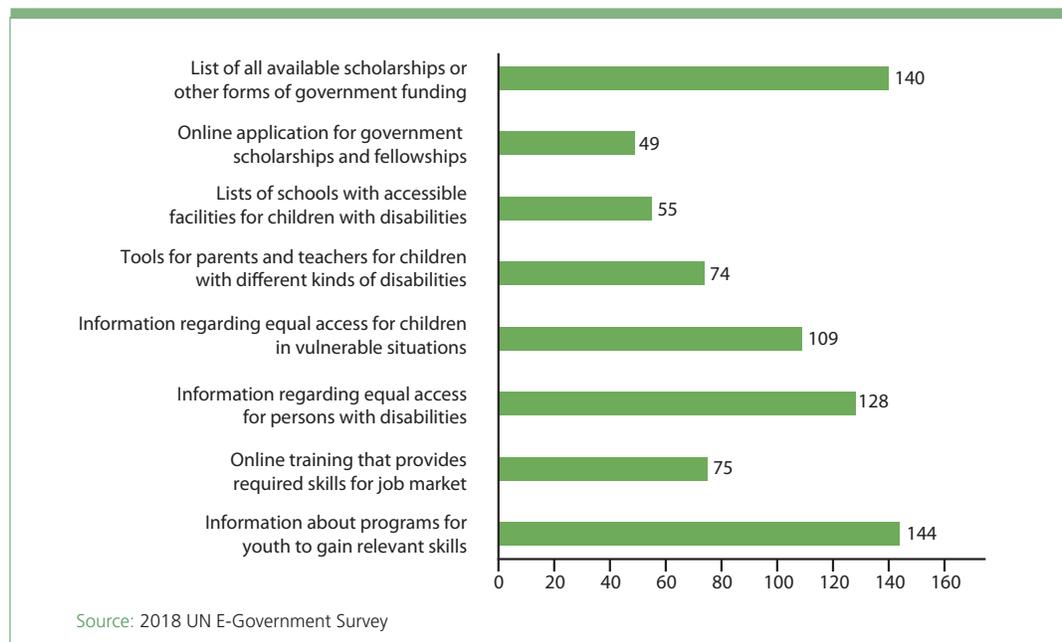
The need to raise skill levels across different population groups is increasingly evident around the world, in response to the so-called fourth industrial revolution. A United Nations' study warned that about 56 per cent of those employed in Southeast Asian outsourcing hubs, such as in Viet Nam as well as Cambodia, Indonesia, the Philippines, and Thailand are at elevated risk of losing their jobs to automation, especially in those textile and manufacturing industries.[79] In response, Viet Nam, for example, is seeking to revise its education and training systems to develop higher-end skills.[80]

Box 2.6.   Europe: Developing digital skills

The fourth industrial revolution (Industry 4.0) is expected to have a significant impact on employment. The World Economic Forum has predicted a net loss of 5 million jobs in 15 developed and emerging markets by 2020 as robots replace humans.[81] Countries around the world are therefore looking to enhance skills among the labour force to create higher value-added jobs and counter the potential negative impact of Industry 4.0.

Europe may be particularly vulnerable to potential job losses as labour costs and automation adoption are both high. It is estimated that 9 out of 10 jobs in the region will require digital skills in the future. Presently, however, less than one-half (44 per cent) of those between 16 and 74 years possess such skills.[82]

The European Commission has established several initiatives to address the challenges of Industry 4.0 and to promote better education. The Digital Skills and Jobs Coalition, for example, brings together Member States, businesses, non-profit organizations, and educational institutions to improve digital skills for all citizens, enhance digital skills in the labour force, develop digital skills for ICT professionals, and transform education to prepare for the future.[83]

Source: http://ec.europa.eu/

2.5   Emerging divides: migrants, restrictions on access, and net neutrality

Technological advancements create new capabilities for communication and are used as tools to gain and share information and to learn the skills needed to participate in a globalized economy.[84] Emerging technologies such as artificial intelligence, cloud computing, big data & analytics, and machine-learning all have the potential to improve the level of social inclusion in a society, including e-health and e-education, among others.

2.5.1.   Migrants

Migration has moved up the global policy agenda in recent years. In 2015, for example, an estimated 160,000 people arrived in Sweden (a country with a population of about 10 million).[85] From an e-government perspective, the growth in migration necessitates a shift in providing services to a more diverse group of people (*see Box 2.7. case study on Finland*). The Swedish Migration Agency website is offered in several languages to provide information to migrants.[86] Such tailored services, however, do not extend to most government websites.

This illustrates that there are institutional gaps in bridging the range of digital divides, especially with emerging divides. Typically, one ministry only serves a segment of the population, such as migrants. Yet tackling digital divides requires a strategic holistic view, and integrated policy actions across government agencies and at local levels.

Box 2.7.   Finland: blockchain for identity management and financial inclusion

Between January 2014 and June 2017, the Finnish immigration authority received more than 41,000 applications for asylum and those who were accepted faced long waiting times to process residence permits and local identity papers. During the waiting period, refugees could not access the banking system and monthly Government-to-Citizen payments had to be made in cash.[87]

In 2015, the government partnered with MONI, a Finnish start-up, to launch a pilot digital financial services programme enabling refugees to receive money and pay bills without opening a bank account. MONI developed a prepaid debit card (Mastercard) linked to a unique digital identity stored on a blockchain which does not require a bank account or identity papers. The service simplifies social welfare payments between the government and refugees and creates a digital trail that allows for credit scoring and increased access to other financial products such as credit.[88] Account holders can apply for a loan through their mobile phone, either from friends or financial companies. The digital trail allows users to lend money to each other, setting a maximum amount. Loans between users have no fees and no interest, and the service is free to use.[89]

As of September 2017, the programme had about 4,000 active accounts and activity has expanded as refugee users find jobs, pay bills and transfer money to relatives. In the fourth quarter of 2017, the programme was launched across the European Economic Area (EEA) allowing adults over 18 to sign up online using a phone number and a residential address.[90]

Source: http://migri.fi/vastaanottoraha

2.5.2.   Country restrictions on information access

The use of global cloud services is creating a new digital divide among local authorities; they are facing challenges in accessing and controlling data within their jurisdictions. Sovereign clouds, or data localization regulations, where information is required to be stored in a certain geographic area are becoming a global trend. This could make information inaccessible to those who are outside the jurisdictions, which could limit access to government information and services for overseas migrants.

While acknowledging the importance of cybersecurity, countries need to recognize the consequences of disguising it as national security, which can limit widespread uptake of ICTs by undermining trust and leading to geographic information divides. Given the challenges ahead, there remains a need for the global community to work together in setting international objectives that affect digital divides while acknowledging the need for local contexts and regulations.

2.5.3.   Net neutrality

The debate surrounding net neutrality -- whether Internet service providers can discriminate against distinct types of usage or should treat all data as the same – has been ongoing for some time. However, the decision of the United States' administration in December 2017 to reverse previous American policies, and, in effect, repeal net neutrality, brought the issue to the forefront of the technology policy debate.[91] The effect of that decision remains to be seen. From an e-government perspective, service providers could, in theory, charge money for access to public- sector websites or slow down the speed with which they could be accessed. Although that is an unlikely scenario, the debate has raised issues of openness and access, such as whether private-sector websites could be restricted in a way that limited access to information from a variety of sources, such as from news.[92] Hence, the larger concern is whether potential new barriers to access content will have an impact on access to information more generally, especially as different countries have different approaches and there are no existing global agreements on this topic.

2.6   Conclusion

Research on e-inclusion has moved beyond identifying whether access is available—the prime focus of early reports on the digital divide—to assessing what people do with their access. A World Bank report in 2016 on "digital dividends", another term for "useful usage" or potential digital productivity, indicates that while global connectivity and service delivery has improved, it has not necessarily improved socio-economic outcomes due to uneven distribution, which highlights the need to bridge digital divides.[93] Since improved socio-economic status for all people is the fundamental point of e-inclusion, this is a concerning gap which will need greater attention moving forward.

To reap the enormous dividends of the information society for sustainable development, countries around the world must tackle current and emerging digital divides. While there is a role for different stakeholders, governments must take the lead in setting standards, deploying strategic instruments, and providing e-government services. Multi-stakeholder partnerships should be forged with civil society and the private sector to stimulate demand for e-government in support of the implementation of the 2030 Agenda. Recommendations include:

• Greater recognition that digital divides exist in all countries and that digital progress can create new divides. In many ways, segments of the population that remain offline in leading e-government countries are at greater risk of being socially excluded if they cannot use "digital first" policy-enforced e-government services.

• Special attention needs to be paid to vulnerable groups as there is a strong correlation between digital exclusion and social exclusion. Persons with disabilities, for example, are often as vulnerable online (due to lack of web accessibility) as they are to offline services.

• There remains a need to bring people online in the first instance. In some cases, this remains a problem due to lack of access to ICT infrastructure. Governments must raise awareness of the value of online services to motivate usage. In this effort, relevant and sufficient content should be provided in local language and at local levels.

• The role of government is critical to ensuring that no one is left behind in implementing the 2030 Agenda. E-participation can serve as a catalyst towards greater e-inclusion.

• Greater attention should also be paid to digital literacy, among the population at large, but also among civil servants. Implementation and delivery of e-services rely on the ability of users to use them. Given the potential socio-economic benefits for citizens and governments alike, greater emphasis should be placed on skills development.

• Raising awareness on information and services and promoting their use require partnerships with other actors, such as civil society and the private sector. The government is a supplier of services, but the demand for them should be promoted across sectors to overcome multiple challenges of different population segments.

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GEARING E-GOVERNMENT TO SUPPORT TRANSFORMATION TOWARDS SUSTAINABLE AND RESILIENT SOCIETIES

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