E-Government for the post-2015 era: the usage perspective

7.1. Introduction

This chapter outlines the current situation of e-government usage, particularly the efforts made by the 193 United Nations Member States. It examines various e-government service channels (including mobile and social media), service channel mix and management in a multichannel world, exploring effective channel management strategies (with good opportunities) to increase e-service uptake. The chapter also looks at selected issues related to e-government service usage in several critical areas which can generate high returns for sustainable development, along with good practices; and provides concluding observations, with some policy suggestions on increasing e-service uptake.

7.2. E-Government usage: the current landscape

Increasing e-government uptake is important in order to reach all citizens for whom the services are intended, thereby maximizing the impacts of government investments in providing e-government services.

7.2.1. The demand-side of the equation

While the provision of e-government services on the supply-side is generally increasing, improvements are needed to the demand-side of the equation (i.e. e-government uptake).[1]

In OECD countries, e-government usage averages out at 50 per cent of its citizens, but there is great variation among countries. The Nordic countries (Iceland, Den-

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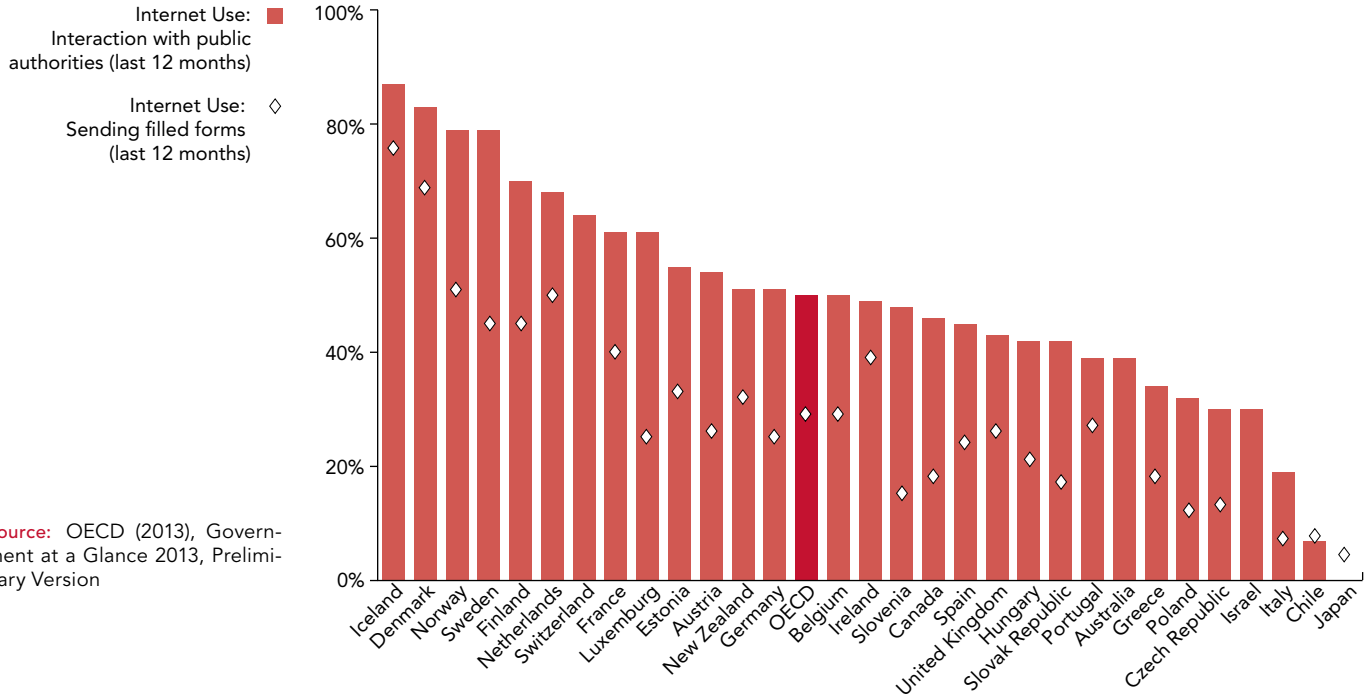
Chapter 7

mark, Norway, Sweden and Finland) are leading with over 80 per cent of citizens using e-government. At the opposite end of the spectrum, less than 20 per cent of citizens in Chile and Italy make use of e-government. Also, in terms of advanced e-government development, Iceland and Denmark are leading (with over 70 per cent of citizens sending forms), whereas Italy's and Chile's usage rate is only about 10 per cent (see Figure 7.1).

In Europe, the *E-Government Action Plan 2011–2015 and the Digital Agenda for Europe* aim to increase the use of e-government services from 44 to 50 per cent of EU citizens (and 85 per cent of businesses) by 2015; with more than half (i.e. 25 per cent of citizens) returning completed forms. EU citizens' regular Internet use (including Internet use by disadvantaged groups) and the supply of e-government services have made much progress towards meeting the Digital Agenda targets. Figure 7.2 shows how the EU scored on e-government and Internet usage targets of the Digital Agenda in 2012 (70 per cent out of 75 per cent and 44 per cent out of 50 per cent).[2]

According to some sources, if current trends continue, the EU could be on track for the European Digital Agenda target of 50 per cent of e-government users by 2015. However, despite an e-government usage increase to 46 per cent of EU citizens in 2013, there are issues that warrant close attention, for example over half of them (28 per cent) are at risk of dropping out after their first experience. Citizens' satisfaction with e-government services and their use also lags behind the private sector (e.g. online banking, online shopping), which is also seen to be problematic.[3]

Figure 7.1. Citizens using the Internet to interact with public authorities in OECD countries (2012)



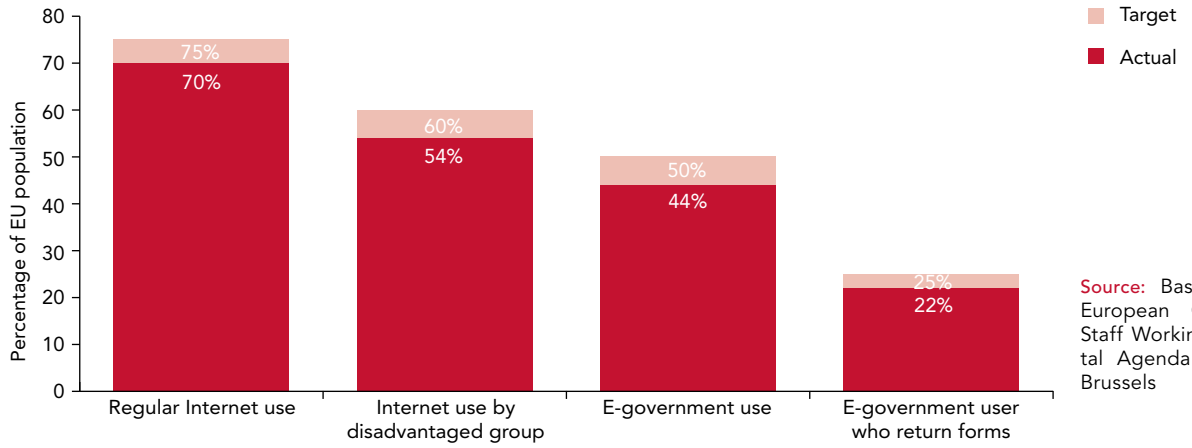
Source: OECD (2013), Government at a Glance 2013, Preliminary Version

Moreover, overall e-government uptake rates in Europe greatly diverge among countries; with the gap between the best performing country (Iceland) with over 80 per cent and the worst performing country (Italy) with less than 20 per cent. Also, national usage rates of United Nations Member States at an advanced e-government development stage vary widely between countries. For example, in Romania, where only 10 per cent of e-government users return filled forms, whereas 85 per cent do in Denmark. Similarly to OECD countries, the EU is thus facing an 'e-government usage divide' among its Member States, which presents a major challenge for European e-government policy-making.

The usage level of advanced e-government remains relatively low. According to EUROSTAT (2013), 52 per cent of individuals in the European Union used e-government to obtain information from public authorities' websites. 35 per cent of them made use of more advanced services such as downloading official forms and 29 per cent sent filled forms in 2010. The latest country-specific data on the extent and type of e-government usage is available in some countries, such as Norway with very extensive (and relatively advanced) e-government usage. Eight in ten persons interacted with public authorities over the Internet, with 72 per cent obtaining information, 52 per cent downloading official forms and 52 per cent sending filled forms to public authorities, whilst 50 per cent sent their income declaration over the Internet.[4]

In the developing world, there is no comprehensive data on actual e-government usage on a global scale. Available country data shows that countries' uptake rate greatly varies. For example, 50 per cent of Colombian citizens interacted with the government through electronic channels in 2012.[5] Similarly, in Turkey, 41.3 per cent of Internet users interacted with public authorities over the Internet, with 37.5 per cent of them obtaining information.[6] In Egypt, e-government service uptake is, however, very low; with only 11.3 per cent of Egyptian households being aware of the existence of e-government services and only 2 per cent of these households actually using these services (2012). The most commonly used services in Egypt are online payment of public utilities.[7]

Figure 7.2. EU Digital Agenda targets and actual performance 2012



Source: Based on data from: European Commission 2013: Staff Working Document, Digital Agenda Scoreboard 2013, Brussels

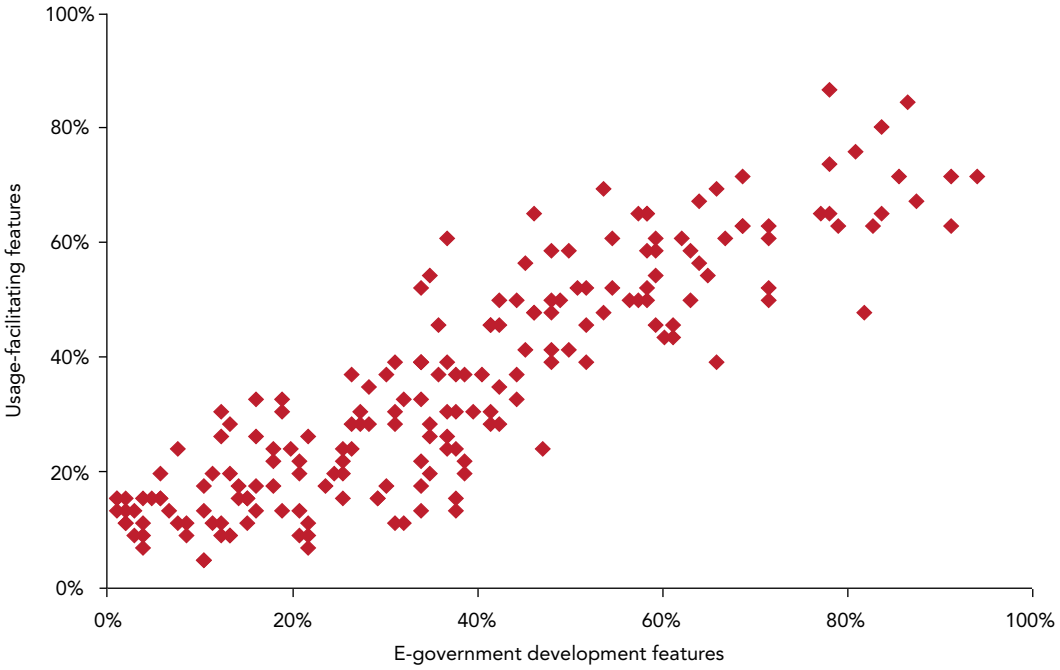
Some governments make explicit efforts to encourage their citizens to use more advanced e-services, which has, however, not proven easy, for reasons such as security. For example, less than half of the taxpayers have adopted e-personal income tax filing in Malaysia, despite the promise of faster refunds by the Inland revenues agency.[8] Basic threshold issues, such as the lingering fear or distrust of online transaction services entailing disclosure of their credit cards, inhibited take-up of e-transaction services.

7.2.2. Countries' efforts to increase e-government uptake

The *United Nations E-Government Survey* does not provide data on the extent of the actual e-government usage in countries around the world. As is well known, it is based on e-government features available on the national portals (i.e. supply side analysis). On the other hand, the 2014 Survey questionnaire includes a set of questions (including usage-facilitating features) that offers *some indication* of 193 countries' efforts to increase service uptake through provision of various usage-facilitating features. All sources of data used in this chapter come from this questionnaire, unless otherwise stated. While broadband infrastructure is certainly a driver of e-government uptake, other factors (e.g. awareness and digital skills) also influence e-government usage. Usage-facilitating features will also have bearings on citizens' e-government uptake.

Countries' efforts to develop e-government therefore need to go hand in hand with their efforts to increase demand. Figure 7.3 presents 193 United Nations Member States' efforts to increase e-government uptake through provision of usage-facilitating features; in comparison with the level of their efforts to provide (non-usage specific) e-government features. Usage-facilitating features include features of usability, usage monitoring and tracking, user feedback and usage promotion; which reflect countries' efforts to increase usage.

Figure 7.3. Usage-facilitating features in comparison with other e-government features for 193 United Nations Member States



Countries are shown as dots in the scatterplot in Figure 7.3. The scoring is shown as a percentage. In each axis, 100 per cent means that all of the features measured by the *United Nations E-Government Survey* are available on the individual country's national portal. The Y-axis represents the percentage of each country's usage-facilitating features, whilst the X-axis presents the percentage of each country's e-government development features—after deduction of the usage-facilitating features.

The figure shows that many countries have balanced their endeavors on e-government services with the aim to facilitate usage. Their efforts on the supply-side are proportional to the efforts made on the demand-side. In countries like Denmark, Venezuela, Croatia and Spain, demand-side efforts even exceeded the supply-side. At the same time, there are many other countries where greater efforts to increase usage are warranted, such as through increased provision of usage-facilitating features on their national portals.

7.2.3. Users, usability and usage dilemma

There is not only a digital divide, but also an e-government usage divide across different types of users within many countries. The divide begins with access to the Internet and extends to the use of e-government services.

The extent of usage is not evenly distributed across different groups (OECD Glance 2012, Pew Institute 2010) and is generally correlated with demographic and socio-economic characteristics (e.g. income, education level, age). It is however interesting to note the "youth gap" in the e-government uptake. This may be because some of the most commonly deployed e-government services, such as tax filings, are either not relevant or are not necessarily dealt with by the youngest age group (OECD Glance 2013).

Furthermore, as more tasks are moved online, there is an increasing concern that a significant portion of the population is shut off from jobs, health care, education and other government services.[9] This situation creates a usage dilemma. Addressing the downside of e-service boom, Hall and Owens (2011) warned that progress in the field may cause a counter effect, with wealthier and tech-savvy citizens gaining faster and easier access to public services. But those underprivileged, who rely on public services (and would benefit most from accessing them on-line) become even more cut off because they lack internet access and/or skills.

There are attempts to address some of these issues in Europe. The previous E-Government Action Plan (2006) focused strongly on "inclusive e-government" which recognized that over the next ten years at least up to 30 per cent of the adult population would not be online and thus unable to avail of the benefits of e-government. It was clear these citizens were, by and large, those who were also vulnerable in some way, so that this group was doubly disadvantaged. Work with Member States was therefore undertaken to ensure that even this group received the advantages of e-government, including through the use of ICT in the back-office to better target people and localities in need and to make service delivery chains more effective, for example by using e-government intermediaries e.g. public kiosks.

During the current Action Plan (2011–2015), there is a heavy focus on administrative burden reduction for example through "digital by default" strategies

in which suitable services for citizens (as well as businesses) are only available online. In countries like Denmark, the Netherlands and the United Kingdom, specific measures are taken for the 15 to 20 per cent of citizens who, it is recognized in practice, will not be able to access online services at least in the short term. Overall, the government still makes very significant efforts by making online services compulsory through boosting usage, even though it needs to make special arrangements to assist this small group. (An example of the UK's Assisted Digital Team is provided in Chapter 5.)

Moreover, there are substantial usability challenges for certain groups of citizens (e.g. older persons interacting with Medicare).[10] Seen from an inclusive, sustainable development perspective, usability is therefore a particularly important usage issue; warranting governments' primary attention in their efforts to advance sustainable development through increased uptake of such groups.

Better usability means greater ability to use e-services, hence increasing the chance for e-government uptake. If a website is difficult to use, people leave. The design needs to make it easy for visitors to find what they need and do the tasks that they have come for. The recent usability flaws of Healthcare.gov (one of the centrepieces of the US Affordable Care Act) show the critical importance of usability for user uptake and e-government success. Likewise, in the EU, difficulties in usage were also identified as a key barrier to adopting e-government services. Search features are the most common usability features found on Member States' websites, with 168 countries including such features. Audio or video contents were present on 148 websites. Advanced search features are less common with only 101 countries (see Table 7.1).

Table 7.1. Number of countries with selected usability features

Usage-enhancing features—available on national portals	*Number of countries*
'Contact us' feature	185
Search feature	168
Audio or video contents	148
Site map or index	131
Advanced search options such as search filters	101
'Help' feature or 'Frequently Asked Questions (FAQs)' section	89
Information on how to make use of datasets	34

Ultimately, it is however not easy to answer the question: what "usability" means and what its components are. Our understanding of usability is also changing and it needs to be interpreted in a variety of new ways, which will also depend on the particular stage of development and the specific needs of each country or locality. In more advanced countries like the United Kingdom, the United States of America, Finland, Singapore and the Republic of Korea, usability is moving away from reliance on sophisticated one-stop-shop navigation portals to a number of other approaches, including the "findability" of a specific service through advanced search engines. The new UK portal (www.gov.uk) has adopted this approach after it was shown that only about 10 per cent of citizens found a service

through the previous navigation portal with the rest arriving through search or linking from other websites, whilst Singapore's citizen portal (www.ecitizen.gov.sg) now highlights an advanced service engine with autocomplete and predictive search results.

There is also an increasing attempt to personalize services to make them more usable, given that users want services completely designed for their own very specific individual needs. This means very simple services are needed defined as having no irrelevant procedures, content or information and this requires that, in the words of the UK government's digital service design principles "government must do the hard work to make it easy and simple for users."[11]

In less advanced e-government countries, as well as in many emerging economies, usability will typically still need to be built strongly on one-stop-shops, awareness and promotion campaigns, user training and incentives. Common to all countries, however, there is a need to focus on maximizing user service fulfilment through making sure that services are relevant, inclusive, easy to use, easy to find and available through multi-channels with mobile becoming increasingly important.

7.3. Towards greater service uptake in a multichannel world

This section will look at different e-government service channels, channel mix and integration, which have important bearings on e-government usage.

In a world with a variety of service delivery channels, an effective channel management strategy—with a good opportunity to increase e-service usage—needs to be based on a careful consideration of the individual service channels for specific purposes and user needs, as well as a proper mix and integration of multiple offline and online channels. Recognizing the need for effective channel management, the Danish city, Copenhagen, has even created a channel strategy team, moving people from its physical centers to the phone or the websites.[12]

The service channels have different characteristics and distinctive value in the channel mix, rendering them better suitable for certain service types than others (see Chapter 5). Rather than moving all services online, it is therefore important to align service delivery channels with different user needs,[13] as well as the specific nature of different public services. The more e-government services (fitting the specific user needs) are delivered through suitable channels, the more they are likely to be taken-up.

Governments therefore need to have a clear view of their users in relation to the services they offer and how these services will be accessed. At the same time, it is also important to deliver services across multiple channels, providing the option for citizens to take up public services via their preferred channels; instead of just relying on e-service channels.[14]

Seen from the inclusive, sustainable development perspective, service delivery across multiple channels is important, particularly as offline service channels continue to be relevant around the world.

Some governments include a range of service channels, including telephone, video or face-to-face interactions as part of their plan to move their services online, though with provisions of channels for "IT have-nots" and "IT will-nots". Countries advanced in this service include the United Kingdom, Denmark, the Netherlands, Australia and the United States of America (see Chapter 5).

In addition to 'aligning' and 'mixing' the service channels, effective channel 'integration' is also likely to increase service uptake. A variety of service channels need to be interoperated seamlessly to enable their use for a single transaction.

Moreover, more personalized public services to the individual citizen, with identification and segmentation of user base (namely, deriving user segments and clustering group of user sharing similar characteristics such as gender, ages, marital status) will help better tailor public services to the needs of individual users with likely positive impact on user service take-up. As far as segmentation is concerned, which is gaining popularity, there are a few examples such as the portal sites of the Netherlands (http://www.overheid.nl) and the Korean Ministry of Health and Welfare (http://www.mw.go.kr/front_new/index.jsp).

The rapidly growing, increasingly ubiquitous, affordable and powerful mobile technology provides governments with important opportunities to extend public services to a wide population (including hard-to-reach citizens and underserved populations).

The socio-economic return of mobile technology is likely to be particularly high in rural areas and developing countries in low-resource settings, because they lack or have limited access to fixed line broadband.

On the demand side, mobile increases user take-up opportunities of public services. In fact, some government agencies are seeing the impact of mobile ubiquity, with a growing number of visitors accessing websites from mobile devices. An example is *GobiernoUSA* (with a 200 per cent increase in mobile traffic from 2010 to 2011) and the US Department of Agriculture's mobile food safety websites with one-fifth of their traffic going to the new mobile version.[15]

Social media (e.g. Facebook, Twitter) is a fast growing networking tool and an emerging channel for governments to listen and communicate directly with citizens. The benefits of social media include helping governments to establish user needs and design more responsive services, instead of just relying on costly and more traditional user needs surveys.

Underlying increasing use of social media as a service channel is often the belief that social media (with its inherent, collaborative and participatory nature) can foster sharing of ideas and information among users themselves and with government towards service improvement. Such information sharing efforts and (potential) user community activism may put pressure on governments to improve and expand services and this in turn is likely to increase user take-up.

Some governments are actively capitalizing on social media; for example Spain is using social media technologies in tax administration (OECD, 2011) and in Chile, the use of social media is firmly embedded as a key component in the government's e-government strategy 2011–2014. Social media is also legitimized in the country as one of the 'valid' channels for citizens to interact with the government to the extent that Chileans have the third highest take-up rate of Facebook in the world (OECD, 2012) and the official government Facebook account has 23,000 likes. Chile's umbrella government Twitter account ("Gobiernodechile") is also the second most popular account across the OECD (after the British Number-10gov account), with followers of almost 3 per cent of the country's population (more than the White House Twitter). The e-government programme ("Startup Chile"), launched in 2011, is also actively taken up by its target users, this time, by non-Chilean users and prospective investors (see Box 7.1).

Box 7.1. "Start-up Chile"—Service uptake by non-Chilean users

The online "Start-up Chile" programme was developed by the Ministry of Economy, with the objective of attracting foreign entrepreneurs to invest in Chile to launch their businesses and thereby help promote Chile as the innovation and entrepreneurial hub of Latin America. The website has all major social networking tools such as Facebook, Twitter and YouTube). In the same year, the programme already had over 3,800 followers, over 100 blog posts, 1,474 likes on Facebook with active conversation about the programme and 105 subscribers and over 5,600 views on YouTube[16] as of mid-October 2013, 1,910 applications were made to make use of the programme, as displayed on the website.

Source: http://startupchile.org/

Such active embrace of social media by the Chilean government as well as the citizens is likely to help reduce the common problem of e-government ("supply-demand disconnect") in Latin America and the Caribbean. This problem of providing services not reflective of user needs is one of the major reasons for past failures of e-government initiatives in the region.[17] Another example is the major US city governments in Washington, D.C., Chicago and San Francisco use social media (including Twitter) to handle 311 service requests by their citizens, which were actively taken up.[18] Also, in African countries like South Africa, social media (especially, Twitter) is used to improve service delivery and is taken up actively by citizens (see Chapter 5).

Social media have their own distinctive value in the current service channel mix with growing potential, but this does not come for free. It enables citizens to have access to government information, provide feedback and even create 'pressure' for service improvement. Governments can also use it to improve their presence and drive e-service uptake. But they should not underestimate the cost (e.g. data mining cost) and effort involved in fully utilizing social media as a service channel.

7.4. Capturing e-government benefits: selected issues and cases

This section will examine e-government usage, selected issues and cases in priority areas (e.g. education, health, poverty, employment and environment) in line with the MDGs and as highlighted in the post-2015 discussions. It will also encompass gender and environmental sustainability related issues in connection with e-government usage. Unlike some e-services developed mainly for efficiency purpose (e.g. e-driver's license), e-government services in these priority areas are likely to generate high returns for sustainable development across countries and for a wide segment of the population, which can then accrue to society as a whole (e.g. e-education).

7.4.1. E-learning and learning without Internet access

Education is one of the strategic development areas which generate high returns. Even small improvements in the quality of education will have a substantial, long-term positive impact on countries' overall development.

The global educational landscape is however full of challenges. While e-learning on the Internet and without Internet access can help deal with these challenges, there are important issues that need to be addressed, including the need to increase e-education usage. In developed regions like Europe, some of the most popular e-government services include 'enrolling in higher education and/or applying for student grant' (56 per cent of users will use the e-channel for this service next time), in addition to 'declaring income taxes' (73 per cent), 'moving/changing address' (57 per cent).[19] But on the whole, even in highly developed OECD countries, the intensity and quality of e-education usage is low.

The broadband imperative for education

Broadband is considered "the missing link" in global access and is an imperative for "Education for All" (one of MDGs), as well as one of the "building blocks of a digital learning environment". In 2010, ITU and UNESCO established a Broadband Commission for Digital Development to boost the importance of broadband on the international policy agenda and promote the expansion of broadband access in every country to accelerate progress in meeting the MDGs. The Broadband Commission's Working Group on Education (WG-E), which aims to promote education for all, emphasized the critical importance of broadband connectivity, with unprecedented potential to bridge education divides and widen access to quality education for all.

Despite accelerated, on-going efforts to develop broadband infrastructures (e.g. the continental Eastern Africa Submarine Cable System (EASSy), an undersea fibre optic cable system connecting countries in Eastern Africa to the rest of the world in Africa) and rapidly advancing wireless broadband, the bandwidth bottleneck still continues to present a major barrier to effective usage of e-education. In 41 countries across Africa, lack of sufficient bandwidth is found to be the biggest constraint to e-learning.

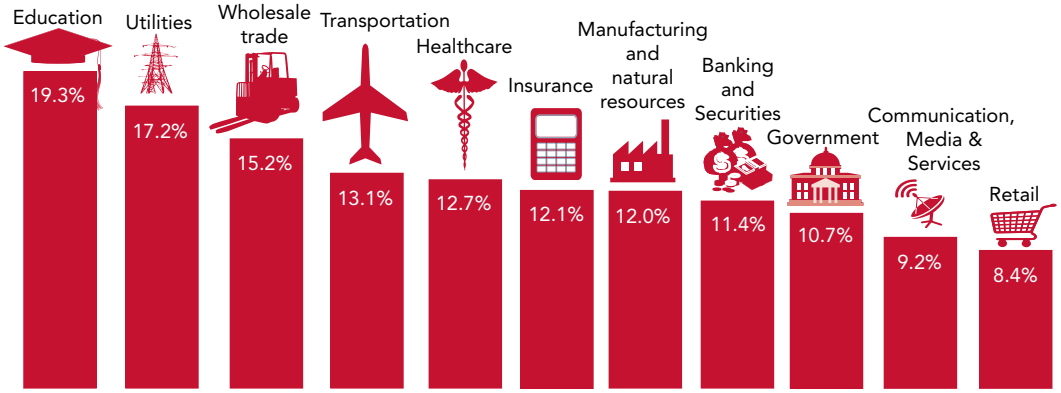
Moreover, as an increasing number of governments push for greater technology integration in schools, sometimes with large-scale initiatives, insufficient broadband can become more pronounced, posing a real problem for e-education service uptake. For example, 64 per cent of the Turkish teachers using Turkey's project, "FATÍH" have reportedly experienced problems with very slow Internet connections. The project seeks to integrate state-of-the-art computer technology into Turkey's public education system and provide tablets and internet access.

So, broadband is undoubtedly a critical factor for maximizing e-learning opportunities. But for e-education to flourish and to maximize user uptake—broadband connectivity alone is not sufficient. As the Broadband Commission Working Group on Education said, the challenge is indeed to help teachers and students use ICTs and broadband in relevant and authentic ways that actually improve learning.[20] Some initiatives, like the pilot e-Schools that the New Partnership for Africa's Development (NEPAD) has established in Kenya (pushing for school connectivity with accompanying training), have produced some encouraging results for uptake of ICTs as a tool to provide low-cost access to online curricular and other resources and to supplement traditional teaching methods. The e-School was regularly accessed by users, irrespective of their gender and role (as either teacher or student).

Wireless broadband to extend educational reach

A great deal of expectation is building around wireless broadband which is now the fastest growing segment of the global ICT market. It can extend the reach of the Internet, expanding access to "anywhere, anytime" learning; and effectively increasingly dissolve boundaries between e-education and m-education. While mobile-for-development services like m-health are currently ahead of m-education services, m-education is poised to become a growth area with substantial investment in m-technology like wireless broadband technology for education. In 2012, the global education sector already spent a higher share (19.3 per cent) of its IT budget on mobile than any other major sector (see Figure 7.4).

Figure 7.4. Percentage of mobile in IT budget, by sector



Source: Deloitte (2013), Gov on the Go—Boosting public sector productivity by going mobile

Wireless broadband is experiencing rapid uptake, but an estimated 1.1 billion households worldwide are still not yet connected to the Internet and more than two-thirds of people in developing countries still remain unconnected. Also, the impact of potential 'leap frogging' over fixed broadband by mobile broadband is very uneven across different developing regions and countries. Furthermore, it remains to be seen whether and when mobile broadband in education will be used at any significant scale in the developing world. We are waiting for wireless broadband to significantly extend its educational reach. M-education is "operating in the dark" and mobile broadband is not yet fast, reliable, or cheap in many countries (see Box 7.2).

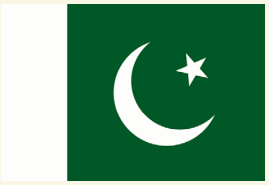
Source: Founder of CyberSmart Africa

Box 7.2. We need affordable broadband internet for m-learning in Senegal (and many other countries)

"(W)e can't reliably use mobile broadband during class time. …what is the timeline for all the essential ingredients for wireless broadband to emerge so as to make it more viable for scale? The only thing we have now that is reliable and cheap is SMS. Yet SMS alone does not make for mLearning as a whole."

Benefits of SMS-education service

While progressively accommodating the emerging and growing broadband platforms to enhance education, governments need to fully exploit and make use of the currently available, more basic options, like SMS. With broadband-based learning still remaining beyond the reach of many developing countries, an increasing number of learning initiatives are making use of the current m-learning options, namely, learning on the mobile phone with basic functionalities. In particular, there are various, innovative SMS to improve learning opportunities in poor countries.



Source: http://www.pakistangendernews.org/sms-based-literacy-programme-education-maybe-just-a-text-message-away/

Box 7.3. The SMS-based literacy programme for women in Pakistan

This programme (launched in 2007), which is entering a fourth phase in 2013, aims to educate 1,500 illiterate women in Punjab and Sindh using tutorials sent via text messages in Urdu. SMS message here is "tutor, textbook and school all rolled into one".

At least 4,000 women have previously benefited from the same programme. In the latest phase, UNESCO has collaborated with government education departments and agencies to increase the project's outreach, leading to more students' participation in the programme. With a view to increasing the programme usage, the phase also includes capacity building of rural female teachers as well as user incentives such as permanent ownership of the phone sets and free SMS from Mobilink for a fixed duration.[21]

The initiatives include "Dr. Math" in South Africa, a mobile tutoring service and "go-to" resource for primary and secondary students in South Africa, with accessibility on the free application MXit and funding and support from the Government. Around 12,000 pupils have used Dr. Math, being assisted by over 100 tutors, with SMS technology facilitating on-going communication between students, coachers and teachers who are geographically distant. It won the 2011 United Nations Economic Commission for Africa's "Technology in Government in Africa" Award. Some SMS-based learning initiatives support and extend education to underserved and particularly hard-to-reach users (see Box 7.3).

7.4.2. Navigating e-health and m-health

The Internet is affecting all sectors of the economy but it offers particular promise in health, and m-health is clearly emerging across the globe. Yet, there are issues and concerns over possible health inequalities through e-health provision and usage, such as data privacy and security issues. M-health (particularly, beneficial for health care and development in low income countries) now needs to move past pilot projects and to be taken to scale, with a view to increasing its effectiveness and reach through uptake by a great number of individual patients, health workers and clinics.

E-health opportunities and inequalities

The great value of e-health (namely, health services and information delivered or enhanced through the Internet and related technologies) is that it enables remote consultations and healthcare service delivery and better dissemination of vital health information to patients (including particularly, in rural and remote areas). E-health may become an area for the emergence of key killer applications that utilize truly high-speed broadband networks—hence it is important for development of e-government services on the whole. Despite its great promise, incorporating ICTs into daily use in healthcare has proven difficult in many parts of the world. In Europe, 81 per cent of hospitals have electronic patient records systems in place, but only 4 per cent grant patients online access to their health information. 71 per cent use online eBooking systems, but only 8 per cent offer patients the opportunity to book their own hospital appointment online. Further, there are only 8 per cent tele-monitor patients at home, and only 30 per cent use ePrescription for medicines.

On the other hand, there is a risk of e-health inequalities, such as differences in the opportunity to use the Internet for health, which present a major challenge for developing as well as developed countries.[22] New health inequalities can also occur, if e-health implementation occurs at the expense of disadvantaged and vulnerable groups or if it implies further cuts to already stretched health systems.

For example, the recent US Federal Communication Commission's report (2010) found that there are growing broadband needs that are largely driven by the rapidly increasing amount of e-health data and exchange of increasingly large files (e.g. 3D imaging).[23] This is leading to connectivity disparity between different

ethnic groups and geographies in the country, with health providers often using a lower level of broadband service in poor communities.

In developing countries, the risk of resource diversion is high. Experts warn that 80 per cent of illnesses stem from preventable infectious diseases in low income countries in Africa and that a focus on high-tech healthcare solutions could come at the expense of basic prevention measures, such as access to clean water, hygiene, health and education.[24] In order to fully exploit the opportunities that e-health provides, governments need to keep sight of actual health needs of their citizens with full consideration of local circumstances in their e-health policy efforts. Furthermore, with a view to facilitating e-health usage, governments in developed and developing countries also need to focus on their citizens' and patients' access, opportunity or requisite skills to participate in e-health under different circumstances.

Taking m-health to scale

M-health stands for the provision of health-related services using mobile communication technology. In particular, m-health information is actively taken up by mobile phone users. For example, in the United States of America, half of smartphone users use their devices to obtain health information. In comparison, in developing countries, health service delivery is often based on basic mobile technology (including particularly, SMS). Since a lot of health care revolves around information, simple text messages can often function as powerful tools to improve health.

M-health is particularly well suited to data gathering, tracking and analysis of health-related surveys, as well as to registering and monitoring patients. For example, the nationwide project, award-winning "mTrac" is a rapid SMS-based disease surveillance and medicine supply tracking system in Uganda, which is rolled out by the United Nations Children's Fund (UNICEF) Uganda and the Ministry of Health throughout the country.[25] The user uptake is strong. As of April 2013, more than 10 million mobile subscribers can engage with the government in monitoring of health services through mTrac, which is rapidly gaining popularity among low income families without computer access.

SMS-based information service can bring impressive change, often meeting a need which would otherwise be impossible to satisfy. Several successful government-led, engaged or supported initiatives focus on maternal and baby's health. They include the US "text4baby" service, "Mobile Alliance for Maternal Action" (MAMA) in Bangladesh and "M-health service initiative" (MOTECH) from Ghana, which delivers individually tailored health information to pregnant women in rural Ghana. There are now more than 25,000 people registered for the MOTECH service and almost 300 community health workers to track their patients via SMS.

At the same time, a vast majority of m-health projects are pilot projects, which are testing various ways to leverage mobile technology for public health. But most of them have been slow to reach scale, lacking a more robust evidence for their scale-up and thereby to move m-health to a greater level of effectiveness.

Only 12 per cent of World Health Organization (WHO) Member States reported evaluating m-health services. In fact, WHO found that the dominant form of m-health today is characterized by small-scale pilot projects that address single issues in information sharing and access.

In fact, some even warn that the inability to break out of the pilot stage holds back m-health in developing countries. Others stress the critical importance of integrating m-health needs into general health programmes. According to the Executive Director of the mHealth Alliance, which is hosted by the United Nations Foundation, m-health could only meet its potential if it was fully integrated into general health programmes, becoming so much a part of health systems that we no longer need to use 'm' as a designation. But this is something that cannot happen unless m-health projects move beyond the pilot phase and really reach scale at a national or regional level.

In this connection, *Mwana* (an m-health project using SMS to deliver early infant HIV test results in Malawi and Zambia) merits special attention, as it presents one of the few projects that has been successful on a large scale, covering almost all of Zambia and Malawi (see Box 7.4). It also shows that sustainability and scale must be planned from the program's inception, with inclusion and buy-in of targeted users and stakeholders during the development phase. It also requires collaboration with multiple stakeholders, including governments, communities and local healthcare providers.

Notwithstanding some successful cases, there are challenges in scaling up individual pilot projects, especially, with a view to integrating them into comprehensive national (e-) health strategies. As m-health initiatives mature to realize their full potential and become fully sustainable, a large number of users should be able to benefit from them. In this connection, effective partnerships with private sector and civil society organizations are also considered essential, including particularly active government involvement, as seen in the case of the Mobile Alliance for Maternal Action (MAMA) in English and known ás Aponjon in Bangali.

Box 7.4. Taking m-health to scale: Mwana programme (Malawi and Zambia)

Launched in 2010 (and implemented by the Zambian Ministry of Health with support from UNICEF), "Mwana" presents "a large mHealth project focused on simple health interventions that provide large health impact". It delivers early infant HIV test results via SMS and succeeds in cutting the turnaround time for HIV results to reach parents more than twice as fast as before. Apart from its simplicity, Mwana's success also accrues from working with local health workers on the collaborative design of m-health information services.

In terms of service uptake, the number of individual end-users is not clear, but over 40 clinics in Malawi use Mwana. The programme aims to scale up the number of clinics using Mwana in the near future to 250 clinics, along with complete coverage of Zambia in three years as part of a national scale up.[26]

Source: UNICEF Zambia (2012), Project Mwana: Using mobile technology to improve early infant diagnosis of HIV

Privacy and security concerns

Privacy and data security issues greatly influence the user uptake of e-government and health care in particular.

Health care requires a great deal of privacy and confidentiality. There are concerns that increased reliance, particularly on mobile devices (as well as today social media) will compromise the confidentiality of their medical information and even compromise healthcare delivery (see Box 7.5). M-health gives rise to serious new security concerns, as expressed during a congressional hearing held before the Committee on Homeland Security and Government Affairs, US Senate in 2012. It was reported that a security flaw in a wirelessly controlled insulin pump was identified, which allows for hackers to break into remotely monitored diabetes pumps. Moreover, while there are several security holes in the device, the principal vulnerability comes from the wireless connection between the glucose monitoring system and the pump itself.[27]

Box 7.5. Further privacy and security concerns: social media use in health

Social media are increasingly used to obtain medical information and advice. For example, a recent US *Survey* (2012) found that 33 per cent of 1,040 US adults use social media to obtain health information, look up consumer reviews of health treatments or physicians. And more than 80 per cent of respondents aged 18 to 24 years said they are likely to share health information.[28]

Given the nature of social media, personal information can be distributed beyond the originally intended target recipients of such information (e.g. family members or healthcare providers), spreading to tens of thousands of people. The lack of subsequent control (exposure of personal health information) is a problem; presenting a challenge to policymakers and health practitioners.

Source: Scanfield D, Scanfield V, Larson EL, 2011, Dissemination of health information through social networks: twitter and antibiotics, Am J Infect Control. 2010 April 38(3): pp.182–8

7.4.3. E-government usage in employment and other critical areas

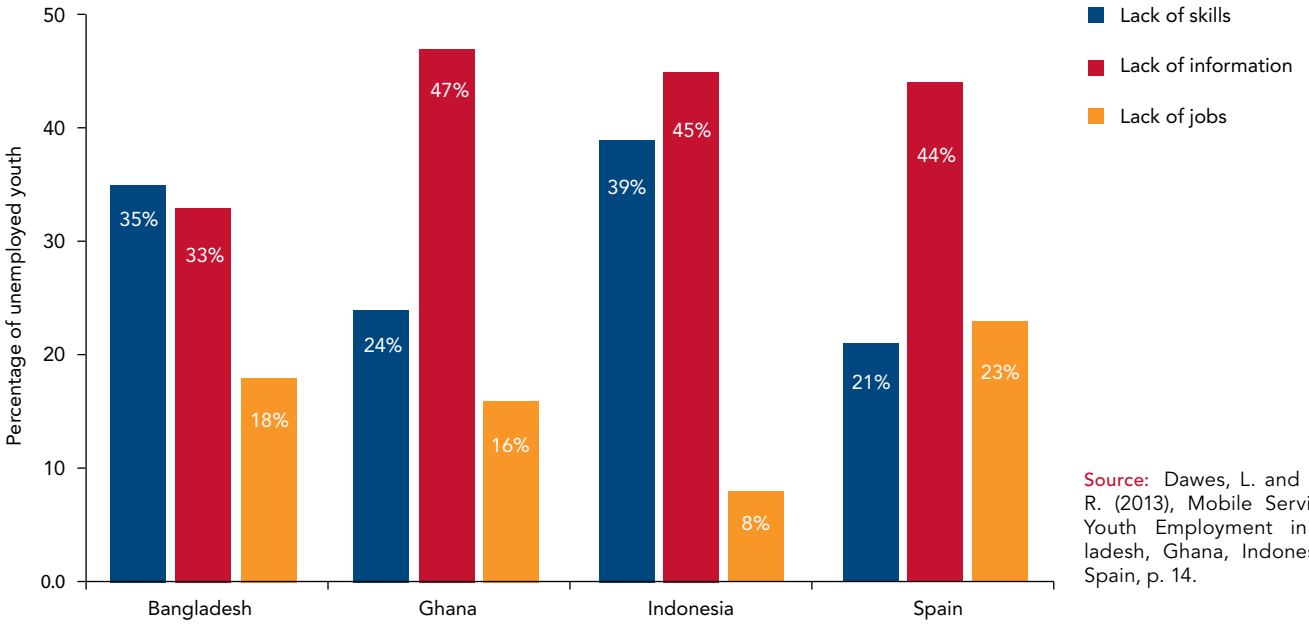
E-employment service usage

E-government can help deliver employment services to potentially extend its reach to job seekers and other citizens, including the rural poor. As far as e-employment service types are concerned, *information* services are one of the most important. According to the latest study on youth employment in Bangladesh, Ghana, Indonesia and Spain, lack of skills and information on jobs available are actually perceived as bigger challenges than the lack of available jobs. Lack of information in all four countries scored high, with between 33 and 47 per cent of youth identifying lack of information as a challenge in job search (see Figure 7.5).[29]

Similarly, the lack of employment information was clearly recognized by many young people in Ghana, Morocco, Uganda and Maharashtra in India, who reported that they did not know where to look for information on employment. For 36 per cent of youth in these four countries, friends and family are the pri-

mary source of employment opportunities and 21 per cent of youth used the Internet as a means of accessing job information. Overall in these countires, 73 per cent of the young people surveyed felt that job information is insufficient.[30] In this connection, Saudi Arabia's government website meets many of these needs, as it allows job seekers to obtain information about a job and also provides tracking tools to track actual usage, both by the number of user views and transactions (see below Figure 7.6).

Figure 7.5. Youth unemployment in Bangladesh, Ghana, Indonesia and Spain: Job search challenges



Source: Dawes, L. and Marom, R. (2013), Mobile Services for Youth Employment in Bangladesh, Ghana, Indonesia and Spain, p. 14.

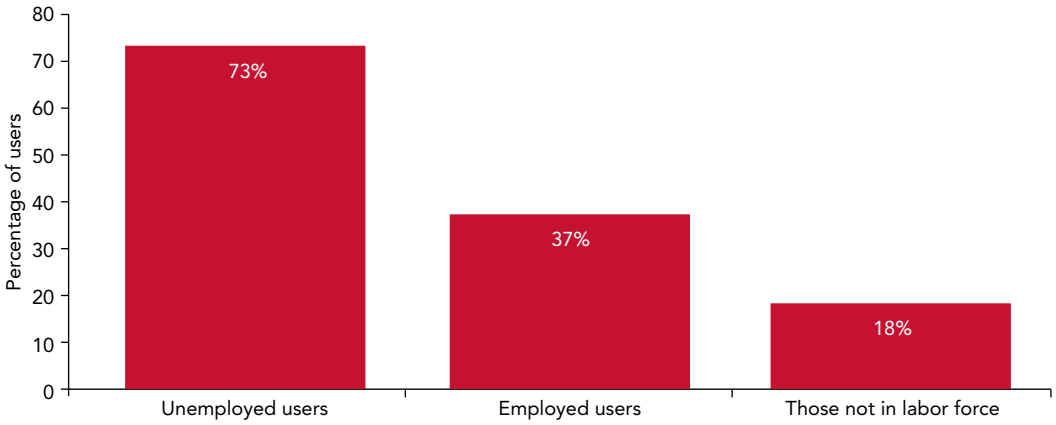
Figure 7.6. Saudi government's employment service website

Source: Saudi government website: http://www.saudi.gov.sa/

In 2011, an average of 18 per cent of citizens in OECD countries used the Internet for job search. In some countries, this was higher, with 25 per cent of citizens in Canada, Denmark, Finland, Iceland, Republic of Korea, Norway and the United Kingdom conducting job searches online. In Europe, in the current economic crisis, e-government policymakers actively expanded and adapted service offerings. The citizen life-event service, 'looking for a job' is currently the service that is used most, with over 70 per cent of users making contact with government online. This is even higher than 'declaring income taxes' (over 60 per cent), which is a highly popular activity in many countries. Some European countries have introduced 'mandatory' usage of e-employment services for job seekers. In the case of the Netherlands, such a policy measure has led to a very high user uptake, with 75 per cent of jobseekers using e-services during unemployment. In Denmark, digitization of the most used public services will also be made mandatory.[31] The increasing demand to use the digital channel for job applications and other services also leads to unemployed citizens' relatively active uptake of such services in countries like the United States.

In Europe, unemployed people are intensive users of the online job search and job application, with 69 per cent of unemployed internet users using online employment service.[32] The tendency for Internet users to go online for job searching, when they are in immediate need of employment, is apparent across many countries. According to the US government agencies' report on the usage gap of e-employment service among different Internet users, unemployed Internet users were nearly twice as likely to look for work online as their employed counterparts. 73 per cent of the unemployed used the Internet for this activity. In comparison, 37 per cent of employed Internet users conducted job searches online (see Figure 7.7).[33]

Figure 7.7. Users seeking online job opportunities, by employment status



Source: United States National Telecommunications and Information Administration and Economics and Statistics Administration.

One of the ways in which Internet use may affect employment is through users' ability to search and apply for jobs online, affecting the usage pattern in terms of different levels of e-employment service uptake among different user groups.

Unlike job seekers in developed countries, who often have such services available and are able to use them, the situation is often different in developing countries.

Here, digital skills and the abilities of job seekers are not sufficient to make use of e-employment services. Government policies to promote usage in this field thus need to be accompanied by focused policies to actively reach out to underserved user groups in order to increase their ability to use such services.

E-government uptake by the rural poor

There is a compelling case to be made for electronic delivery of payment by governments ("e-payment") and its utilization for poverty reduction through increased usage by people living in poverty, especially, the rural poor.

Three quarters of the world's population living in poverty have no bank account. And a vast majority of people living in poverty in developing countries live in rural areas. E-payment can benefit millions living below the poverty line; improving service delivery, reducing corruption and generally boosting financial inclusion of people living in poverty. Several e-payment programmes around the world have shown positive results with substantial poverty reduction effects, government savings on administrative costs by as much as 75 per cent, as well as user participation and uptake.

Brazil's social safety net programme (an e-payment programme) with strong user uptake, called *Bolsa Familia* was used by 2 million Brazilian users. One of the most recent and noteworthy e-payment initiatives is the Indian Government's Electronic Fund Management System (eFMS) which involves disbursement of wages direct to the accounts of National Rural Employment Guarantee Scheme (NREGS) beneficiaries.

NREGS is the largest public works programme in the world. Given the enormous size of NREGS, the user base of eFMS is also big. For example, there are 1.7 million households in the Indian state of Odisha that were provided with NREGS jobs in the budget year 2012–2013. They could be paid using eFMS which aims to drastically cut down payment delays of wages to NREGA beneficiaries and also bring about much needed transparency. Some other Indian states like Odisha, Karnataka, Haryana and Rajasthan, have already made substantial progress in this regard, and there will be further expansion of eFMS facilities to other parts of India.

On the demand side, 4 million recipients of NREGA benefits have chosen e-payment branchless banking over physical payment mechanisms, which has considerably reduced number of complaints from rural wage seekers about delayed payments. Moreover, e-payment provides some important strategic (though, indirect) benefits. Efficient and reliable e-payment can lead to increased user trust in e-government services such as NREGS, thereby increasing user take-up and expanding public service reach. In fact, some e-payment pilot studies in India have demonstrated that e-payments increase the utilisation of government services by people living in poverty. While in some parts of India, rural beneficiaries are not completely convinced about the government's ability to follow through on its promise to pay them through their NREGS program, in other parts (e.g. districts in Andhra Pradesh), the utilisation of NREGS funds increased by 25 per cent once payment reliability was improved through e-payment initiatives.[34]

E-government and the poverty-environment links

Even though environmental sustainability in the context of poverty eradication in the development process has been highlighted, the critical links of environment with poverty are not yet fully addressed. The livelihoods and food security strategies of people living in poverty often depend directly on the natural resources available to them such as farming and fishing. And there is much concern over a 'resource squeeze', due to growing competition for environmental resources that particularly affects people living in poverty. In this regard, e-government can make an important contribution, e.g. by providing environment information critical for 'survival' of people living in poverty and also by helping to monitor the effects of climate change or impending natural disasters like drought or flood through early warning system and environmental surveillance. A pertinent case is the use of sophisticated mapping techniques overlaying data from a variety of sources, which enable policy-makers to better manage wetlands in Uganda.

In terms of environmental monitoring, the *Service Level Benchmarking Connect* project in India is a good example of using mobile technology to track how citizens experience water service delivery. It collects and analyzes citizen feedback using innovative mobile applications; thereby providing a 'reality check' on service levels from the citizens' standpoint. It gives city managers more 'granular' data at the sub-city level (ward/zone), which can facilitate improved monitoring and problem solving and provides inputs into project planning processes for service providers. Most importantly, the project provides a suitable platform to engage citizens in performance monitoring processes and encourages them to demand better services. Given the large urban populations living in informal settlements in Indian cities and the service inequities commonly prevalent in service provision, the project enables explicit tracking of service delivery in slum areas including public facilities such as public stand posts and community toilets. The project was implemented in two cities of India over the past year and is now being replicated in 20 more cities.[35]

7.5. Conclusion

This section provides the following conclusions and a few policy suggestions on effective e-government uptake, so as to fully capture e-government benefits towards advancing sustainable development.

- At the most fundamental level, e-government policy must focus on the demand side of the equation, instead of just focussing on the supply side of e-government services and on areas and applications which are likely to generate high returns for sustainable development and to benefit the majority of citizens (e.g. in education), rather than those primarily driven by efficiency considerations (e.g. e-driver's license). E-government policies aimed at increasing user uptake ought to be guided by the simple question: 'how to get people to use e-government services'. This leads to questions of relevance of e-government content to users, motivational factors (especially convenience), as well as usability and other usage-influencing factors. At the same time, policies

need to focus on a range of threshold issues and barriers to e-government usage (including particularly, privacy and security issues in health care and other areas). Policy efforts to maximize usage can however not just end with increasing usage, but also aim to obtain the actual benefit from that usage for all stakeholders.

- The links between e-service delivery, usage and sustainable development are mediated and influenced by fundamentals like education, skills and digital infrastructure. Governments wishing to succeed in e-government would therefore do well to invest in strengthening these particular fundamentals, including broadband.
- Governments need to improve capacity to effectively seek citizen feedback, monitor, track and analyze usage trends, so as to prioritize service digitization and integrate relevant data into policy. User feedback can provide important data for integration into policy efforts to increase service usage.[36] Besides e-government promotion and awareness campaigns, evaluation needs to be an integral part of a policy effort to increase e-government uptake, which is also an important part of educating the public about the benefits of e-government, thereby helping to increase user uptake.
- Finally, the government is a "platform", not a "vending machine".[37] As aptly described, citizens tend to think of government as a kind of vending machine. They put in taxes and get out services that governments provide. However, this vending machine idea is giving way to the idea of "government as a platform". The platform metaphor means that government provides a system in place to deliver services not by governments alone, but also by citizens and others (which also allows people inside and outside to Innovate). In doing so, governments embrace collaboration with partners such as NGOs to enhance value for citizens and increase uptake; orchestrating these partnerships and acting as catalyst and facilitator.

  Governments need to effectively manage such collaboration with clear 'rules of the game', including partners' roles and responsibilities, while also allowing for those inside and outside governments to develop innovative arrangements with a view to delivering services more effectively and increase usage.

  In essence, the challenge of increasing e-government usage is therefore a governance challenge.