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UNITED NATIONS E-GOVERNMENT SURVEY 2014

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The drawing on the front cover was designed by Ms. Qiuchen Wang who in 2013 served as an intern in the Division for Public Administration and Development Management (DPADM) of UNDESA. The drawing was prepared as part of DPADM's submission for the 2013 UN Online Volunteering Award.

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Department of Economic and Social Affairs

UNITED NATIONS E-GOVERNMENT SURVEY 2014

E-GOVERNMENT FOR THE FUTURE WE WANT

United Nations
New York, 2014

United Nations Department of Economic and Social Affairs

The Department of Economic and Social Affairs of the United Nations Secretariat is a vital interface between global policies in the economic, social and environmental spheres and national action. The Department works in three main interlinked areas: (i) it compiles, generates and analyzes a wide range of economic, social and environmental data and information on which States Members of the United Nations draw to review common problems and to take stock of policy options; (ii) it facilitates the negotiations of Member States in many intergovernmental bodies on joint courses of action to address ongoing or emerging global challenges; and (iii) it advises interested Governments on the ways and means of translating policy frameworks developed in United Nations conferences and summits into programmes at the country level and, through technical assistance, helps build national capacities.

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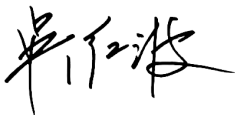
Foreword

At the United Nations Conference on Sustainable Development held in Rio de Janeiro in June 2012, a global consensus was reached that to achieve our sustainable development goals we need institutions at all levels that are effective, transparent, accountable and democratic. E-government holds tremendous potential to improve the way that governments deliver public services and enhance broad stakeholder involvement in public service.

The 2014 edition of the *United Nations E-Government Survey*, coming on the heels of a ten-year period of the World Summit on the Information Society (WSIS) action line implementation, asserts that information and communication technologies are potent enablers of the effective, transparent and accountable institutions envisaged by world leaders at Rio. Countries in all regions of the world and at all levels of development continue to make significant investments in public sector ICT for these reasons. It is my view that such efforts are vital to achieving broad public participation in decision-making, enhancing access to information and removing barriers to public service—all essential if we are to assure a future of equitable economic growth and sustainable development that are free of poverty and hunger.

I commend this report to policy-makers, leading officials and analysts considering the contribution that e-government can make to the future we want and the place of effective public management in good governance in the post-2015 era.



WU Hongbo
Under-Secretary-General for Economic and Social Affairs
and Secretary-General for the International Conference
on Small Islands Developing States

For the family of and in memory of

Haiyan Qian,

Late Director of DPADM, UNDESA,
for her visionary and dynamic leadership,
and her dedication to global public policy, e-government,
public administration and development

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Preparation of the publication was undertaken by a group of senior e-government researchers and advisers initially under the overall guidance of the late Haiyan Qian, Director of DPADM, DESA, and then by Vincenzo Aquaro, Chief of the E-Government Branch (EGB).

Vincenzo Aquaro also led the Data Management Team in the data collection and *Survey* research. The team included Adriana Alberti, Senior Governance and Public Administration Officer; Anni Haataja, Governance and Public Administration Officer; Wai Min Kwok, Governance and Public Administration Officer; Deniz Susar, Governance and Public Administration Officer and it was supported by Elie Hobeika, Associate Governance and Public Administration Officer and Oksana Yarashuk, Programme Assistant. The team was assisted by Said Maalouf, Daniela Marin Puentes and Quentin Tourancheau, consultants in DPADM. Vincenzo Aquaro, Roberto Bellotti, Associate Professor in Experimental Physics, University of Bari, Italy; Elena Garuccio and Nicola Amoroso, Quantitative Analysts, University of Bari, Italy, provided technical advice on the refinement of the statistical methodology and Elena Garuccio conducted the statistical regressions.

The analytical work was coordinated by John-Mary Kauzya, Chief of the Public Administration Capacity Branch (PACB), DPADM. The Report was written by a team of DPADM staff members. Chapter 1, the Annexes and the Methodology section were drafted by Wai Min Kwok and Anni Haataja supported by Elie Hobeika and assisted by Said Maalouf, Elena Garuccio and Daniela Marin Puentes. Chapter 2 was prepared by Patrick Spearing, Senior Governance and Public Administration Officer; Chapter 3 was authored by Elia Armstrong, Chief, Development Management Branch (DMB); Chapter 4 was written by Adriana Alberti; Chapter 5 was prepared by Wai Min Kwok while Chapter 6 was authored by Seema Hafeez, Senior Governance and Public Administration Officer. Chapter 7 was written by Seok-Ran Kim, Governance and Public Administration Officer and Chapter 8 was prepared by Deniz Susar. Richard Kerby and Jonas Rabinovitch, Senior Inter-Regional Advisers in DPADM, provided case studies and field data. The Executive Summary, substantive and editorial revision was undertaken by Vincenzo Aquaro, Adriana Alberti, Jeremy Millard, Senior Consultant at the Institute of Technology in Denmark and Elie Hobeika assisted by Oksana Yarashuk and Daniela Marin Puentes.

The *Survey* benefited from the advice and guidance provided by a group of experts who met in New York in December 2012. The group consisted of Mr. Abdulla Al Hamid, Executive Director of INVESTATE Group, Bahrain; Mr. José

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In November 2013, the United Nations Volunteers programme announced that UN DESA was one of the ten winners of the "Online Volunteering Award 2013" in recognition of the effort undertaken by the *United Nations E-Government Survey* 2014 Data Team led by the E-Government Branch of the Division for Public Administration and Development Management.

Acronyms

API	Application Programming Interfaces
BYOD	Bring Your Own Device
CDO	Chief Data Officer
CIO	Chief Information Officer
DAE	Digital Agenda for Europe
DPA	Data Protection Act
DRR	Disaster Risk Reduction
EGDI	E-Government Development Index
EPI	E-Participation Index
EU	European Union
FOI	Freedom of Information
G2C	Government-to-Citizen
G2G	Government-to-Government
GDP	Gross Domestic Product
GNI	Gross National Income
HCI	Human Capital Index
HDI	Human Development Index
ICT	Information and Communications Technology
IT	Information Technology
ITU	International Telecommunication Union
LDC	Least Developed Countries
LLDC	Land-Locked Developing Countries
MDGs	Millennium Development Goals
NEPAD	The New Partnership for Africa's Development
NGO	Non-Governmental Organization
OECD	Organization for Economic Cooperation and Development
OGD	Open Government Data
OSI	Online Service Index
PPP	Public-Private Partnership
RSS	Really Simple Syndication
SIDS	Small Island Developing States
SMS	Short Message Service
TII	Telecommunication Infrastructure Index
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
WAP	Wireless Application Protocol
WOG	Whole of Government
W3C	World Wide Web Consortium

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Executive summary

The linkages of e-government and sustainable development

The Millennium Development Goals (MDGs) set by world leaders more than ten years ago have made a huge impact on the lives of billions of people. In particular, extreme poverty has decreased in every region and substantial progress has been made in access to safe-drinking water, decent housing and life-saving HIV treatment, while between 2000 and 2011 the world has achieved parity in primary education between girls and boys with more than 40 million children attending school. However, progress has been uneven: more than one billion people still live in extreme poverty and there are persistent challenges in eradicating hunger, improving health, promoting gender equality, enhancing access to clean water and sanitation, among others. As the United Nations continues to promote prosperity, equity and peace beyond 2015, a global conversation has begun to define a concrete sustainable development framework that embodies these bold, ambitious and universal values.

The United Nations General Assembly in its resolution entitled "The Future We Want" has reaffirmed the strong need to achieve sustainable development by promoting sustained, inclusive and equitable economic growth, creating greater opportunities for all, reducing inequalities, raising basic standards of living, fostering equitable social development and inclusion and promoting the integrated and sustainable management of natural resources and ecosystems. It stressed that all levels of government and legislative bodies play an important role in promoting sustainable development. Overall, "the goal of sustainable development is to ensure the promotion of an economically, socially and environmentally sustainable future for the planet and for present and future generations. Sustainable development emphasizes a holistic, equitable and far-sighted approach in decision-making at all levels. It rests on integration and a balanced consideration of social, economic and environmental goals and objectives in both public and private decision-making. It emphasizes intragenerational and intergenerational equity". (E/2013/69, para. 6).

As we near the 2015 deadline for the current MDGs and start to prepare the ground for the next steps in global sustainable development, it is clear that all governments are faced with a set of complex, multi-faceted and interdependent challenges. Global challenges including poverty, inequality, climate change, peace and security, are such that no single actor—let alone single government

or single ministry—can effectively deal with them on their own. Effective collaboration among agencies across all levels of government is essential, as it is with non-governmental actors, to ensure good governance and good development outcomes. Collaborative governance, underpinned by a well-functioning public administration, is crucial to improving people's lives. The public sector must deliver, equitably and efficiently, essential services that meet citizen needs, provide opportunities for economic growth, as well as facilitate citizen engagement and participation in public policymaking and service delivery, so as to promote the empowerment and well-being of all people.

E-government and innovation can provide significant opportunities to transform public administration into an instrument of sustainable development. E-government is "the use of ICT and its application by the government for the provision of information and public services to the people" (Global E-Government Readiness Report 2004). More broadly, e-government can be referred to as the use and application of information technologies in public administration to streamline and integrate workflows and processes, to effectively manage data and information, enhance public service delivery, as well as expand communication channels for engagement and empowerment of people. The opportunities offered by the digital development of recent years, whether through online services, big data, social media, mobile apps, or cloud computing, are expanding the way we look at e-government. While e-government still includes electronic interactions of three types—i.e. government-to-government (G2G); government-to-business (G2B); and government-to-consumer (G2C)—a more holistic and multi-stakeholder approach is taking shape.

Through innovation and e-government, public administrations around the world can be more efficient, provide better services and respond to demands for transparency and accountability. E-government can help governments go green and promote effective natural resource management, as well as stimulate economic growth and promote social inclusion, particularly of disadvantaged and vulnerable groups. ICTs have also proven to be effective platforms to facilitate knowledge sharing, skills development, transfer of innovative e-government solutions and capacity-building for sustainable development among countries. E-government can generate important benefits in the form of new employment, better health and education.

The conceptual framework of the *United Nations E-Government Survey*

Since its inception in 2003, the conceptual framework of the *United Nations E-Government Survey* has adopted a holistic view of e-government development resting on three important dimensions: (i) the availability of online services, (ii) telecommunication infrastructure and (iii) human capacity. The methodological framework has remained consistent across survey periods while carefully updating its components to reflect evolving successful e-government strategies, pioneering practices and innovative approaches to tackling common challenges for sustainable development.

The United Nations E-Government Survey's conceptual framework is based on the following guiding principles.

- First, e-government in this *Survey* is considered to be the means to an end, the end being development for all. It is considered to be a powerful tool at the disposal of governments, which, if applied effectively, can contribute substantially to eradicating extreme poverty, protecting the environment and promoting social inclusion and economic opportunity for all. It is intended to support the development efforts of United Nations Member States.
- Second, the *Survey* and its results must be placed in the context of the overall pattern and level of development of each country concerned. It is vital that the assessment of the on-line presence of governments highlighted by the *Survey* does not provide a distorted picture of the progress made—and challenges faced—by Member States. At the same time, it is equally important to underscore the promise of e-government. Therefore, main measurements in this *Survey* are based on e-government readiness, which duly takes into account not only countries' specific e-government initiatives, as evidenced by web presence, but also their infrastructure and human resource endowments.
- Third, the focus of the *Survey* is on provision of socio-economic and environmental services to the population through the use of e-government as a programmatic tool, as well as on participation and social inclusion.
- Finally, the *Survey* assesses e-government readiness worldwide, taking the view that the ultimate objective remains the "inclusion of all" in development.

An overview of the 2014 *United Nations E-Government Survey*

The *United Nations E-Government Survey* is produced every two years by the Department of Economic and Social Affairs. It is the only report in the world that assesses the e-government development status of the 193 United Nations Member States. It serves as a tool for decision-makers to identify their areas of strength and challenges in e-government and to guide e-government policies and strategies. The publication also highlights emerging e-government trends, issues and innovative practices, as well as challenges and opportunities of e-government development. Each chapter provides an analysis of the *Survey*'s data, as well as highlights strategies, challenges and opportunities so as to provide policy options. The *Survey* is intended for government officials, academics, intergovernmental institutions, civil society organisations, the private sector and citizens at large.

The theme of the 2014 edition of the *United Nations E-Government Survey*—E-Government for the Future We Want—is particularly relevant to addressing the multi-faceted and complex challenges that our societies face today. The publication addresses critical aspects of e-government for sustainable development articulated along eight chapters.

Chapter 1 presents an overview and broad analysis of the 2014 *Survey* data by providing progress at a glance, regional developments and information by specific country groups, including Small Island Developing States, Landlocked Developing Countries and Least Developed Countries. Chapter 2, on progress in online service delivery, presents how online services are measured and explains what is new in the 2014 *Survey*. Chapter 3, which focuses on e-participation, examines global and regional rankings of e-participation, as well as trends by sectors and levels. It also highlights opportunities and challenges in this area. Chapter 4 focuses on the critical role of whole of government to promote holistic and integrated approaches to e-government development. It explores how to promote collaborative leadership, shared organizational culture, institutional frameworks for effective coordination and accountability; innovative processes for service delivery and citizen engagement; and IT management strategies for enhanced collaboration. Chapter 5, which focuses on mobile and other channels for inclusive multichannel service delivery, explores the global and regional trends of various channels of public service delivery, including web portal, email, SMS text service, mobile portal and mobile application, social media, public kiosks, public-private partnerships, counter and telephone services. It also examines principles of a multichannel approach. Chapter 6 looks at trends in bridging the digital divide and offers an overall picture of digital connectivity with a specific focus on e-services for disadvantaged and vulnerable groups at the national level. It seeks a better understanding of the challenges that Member States face in tackling this important issue. Chapter 7 outlines the current situation of e-government usage and highlights the efforts made by 193 United Nations Member States. It offers insights into greater service uptake in a multichannel world and it captures e-government benefits for sustainable development through increased user uptake. Chapter 8 offers global and regional trends in Open Government Data (OGD) and examines the findings of the 2014 *Survey* in this area.

Global trends in e-government

Due to a number of factors, there are wide disparities among regions and countries in their state of e-government development as observed throughout the 2014 *Survey*. One clear observation is that the income level of a country is a general indicator of economic capacity and progress, which thus influences its e-government development. Access to ICT infrastructure and the provision of education, including ICT literacy, are related to the income level of a nation. The absence of these factors hinders the implementation of e-government initiatives. However, it is clear that national income does not, by itself, constitute or guarantee e-government development. There are many countries that have significantly advanced their e-government despite relatively low national income, just as there are many countries which are lagging behind despite their relatively high income and thereby have good opportunities for future improvement.

The Republic of Korea has retained the top spot in 2014 with its continued leadership and focus on e-government innovation. Australia (2nd) and Singapore (3rd) have both increased considerably over their 2012 global rankings. As in previous years, the 2014 *Survey* shows that Europe continues to lead with the highest regional E-Government Development Index (EGDI) followed by the Americas led

by the United States of America (ranked 7th globally); Asia led by the Republic of Korea; Oceania led by Australia; and Africa led by Tunisia (ranked 75th globally). Nevertheless, the 2014 *Survey* shows that each geographical region exhibits high internal diversity. The leading nations in Europe include France (4th), Netherlands (5th), United Kingdom (8th) and Finland (10th). There is little doubt that underpinning this aggregate snapshot is the level of economic, social and political development of the countries concerned, and one of the primary factors contributing to a high level of e-government development is past and current investment in telecommunication, human capital and provision of online services.

Table ES.1. World and regional e-government leaders

World e-government leaders	*Regional e-government leaders*	
Republic of Korea	AFRICA	Tunisia
Australia		Mauritius
Singapore	AMERICAS	United States of America
France		Canada
Netherlands	ASIA	Republic of Korea
Japan		Singapore
United States of America	EUROPE	France
United Kingdom		Netherlands
New Zealand	OCEANIA	Australia
Finland		New Zealand

The 2014 *Survey* also examined the specific challenges and progress of e-government in the following three country groups: the Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Land-Locked Developing Countries (LLDCs). Despite the serious economic, social and environmental challenges which many of these regions and groups face, they each show outstanding examples which overcome their regional and income constraints to achieve significant e-government development.

In terms of online service delivery, the 2014 *Survey* saw an increased emphasis on e-participation features and evidence of Open Government Data initiatives on national websites given the evolving expectations about transparency and participation in public affairs. E-environment was also included in the basket of basic online services assessed—alongside education, health, finance, labour and social welfare functions—given the need to promote environmental stewardship.

Progress in online service delivery

In 2014 for the first time, all 193 United Nations Member States now have national websites, but the majority remain at the low or intermediate levels of e-government development, termed emerging and enhanced stages in the United Nations four stage online service model. Even in the case of countries with highly advanced ICT infrastructures and human resources, it can be difficult to move to the higher stages with transactional and connected services, given that these

typically require robust data protection and online payment systems, as well as secure data sharing across government institutions. It is again clear that factors other than national income are equally important, including high-level political support and leadership, strengthened institutional capacity, public accountability and citizen engagement, as well as adequate e-government programmes, ICT infrastructure and education.

In terms of usability features, a large majority of countries provide users with basic search tools to locate content, and most now do so in more than one language. However, only about half of the United Nations Member States maintain an advanced search engine, only 40 per cent enable user opinion features, such as tag clouds and 'hot topics' lists and less than one third show the availability of a secure connection. There also appears to be substantial underutilization of the potential of text-based Short Message Service (SMS) despite the dramatic global growth of mobile devices usage, including in the low income countries. The most frequently found transactional services include setting up of personal online accounts, income tax filing and business registration, but overall there is great diversity in types.

On the whole, therefore, the 2014 *Survey* data shows substantial variability in the scope of online service delivery. Differences between the highest and lowest online service scores and between the different stages of e-service development are considerable, despite progress in some areas. A large number of countries fall in the bottom third of the Online Service Index (OSI), and there appears to be a widening gap between the e-government 'haves' and 'have-nots' as technology evolves. Improved access to telecommunication infrastructure has facilitated e-government development in some cases, but in general the most advanced countries have continued to outpace the less developed in online service delivery.

Empowering people through expanding e-participation

There are clear opportunities for the future improvement of e-participation, including technology trends towards, for example, social media and mobile devices/technology which are inherently interactive, as well as crowdsourcing. There are also severe challenges, including the digital divide, low user take-up and the lack of incentives to participate. These opportunities and challenges call for effective strategies to create an enabling environment for e-participation, including appropriate legal and institutional frameworks, capacity-development for digital media literacy for citizens and a seamless integration of online and offline features for public participation.

Successful strategies need to address both formal and informal approaches to citizen engagement. To increase the likelihood of success for e-participation strategy, governments can benefit from those platforms and channels that are already in use by citizens rather than creating new ones. Promoting a clear idea and understanding of e-participation by integrating both online and offline communication tools and channels will help reach groups that are difficult to reach. Governments should encourage issues-related participation and provide consistent feedback on consultations to citizens. Motivating engagement depends more on a sense of belonging

to a political community with shared traditions and values than simply civic duty, as it does on linking these directly to the pressing issues of sustainable development.

The Netherlands (1) and the Republic of Korea (1) are leading the world e-participation ranking, followed by Uruguay (3). Morocco and Kenya are the frontrunners in Africa, Uruguay and Chile head the rankings for the Americas. The top performing countries for e-participation in Asia are the Republic of Korea and Japan. Finally, Australia and New Zealand still lead Oceania.

Table ES.2. World and regional e-participation leaders

World e-participation leaders	*Regional e-participation leaders*	
Netherlands	AFRICA	Morocco
Republic of Korea		Kenya
Uruguay	AMERICAS	Uruguay
France		Chile
Japan	ASIA	Republic of Korea
United Kingdom		Japan
Australia	EUROPE	Netherlands
Chile		France
United States of America	OCEANIA	Australia
Singapore		New Zealand

The critical need for whole-of government-approaches and collaborative governance

Although sustainable development challenges have significantly changed over the past decades and are becoming increasingly interdependent, government institutions and their functions are still largely shaped by early 20th century models of public administration in which ministries and their leaders work in "silos" and issues are tackled through a sectoral rather than a collaborative perspective. At the same time, citizens and businesses are demanding more open, transparent, accountable and effective governance, while new technologies, especially ICT, are enabling effective knowledge management, sharing and collaboration between all sectors and at all levels of government whether cross-border, national or local.

The 2014 *Survey* focuses even more than in previous years on whole of government and collaborative public governance issues at the national level as the key to addressing these complex and wide scope challenges which require integrated responses. In this context, a number of enabling factors are needed to advance whole of government. First, there is a critical need for new forms of collaborative leadership and shared organizational culture, including re-shaping values, mindsets, attitudes and behaviours in the public sector through visible guiding principles and leadership. Second, new forms of institutional frameworks for effective coordination, cooperation and accountability need to be put in place across government, between governments and with relevant non-public actors which can contribute to creating public value. Third, innovative coordination processes

and mechanisms for service delivery, and citizen engagement and empowerment are essential, as is making such services inclusive and accessible by all groups in society, including disadvantaged and vulnerable groups. Fourth, and linked to this, collaborative mechanisms are required to engage citizens in service delivery and decision-making processes which are citizen- and user-centric and, where relevant, user-driven via co-creation and crowdsourcing through decentralized governance systems.

Finally, and often underpinning the other enabling factors, it is essential to harness the power of new technology through appropriate ICT management strategies for enhanced collaboration. The global spread of the Internet and the application of ICT in government, as well as greater investments in telecommunication infrastructure coupled with capacity-building in human capital, can provide opportunities to transform public administration into an instrument of collaborative governance which directly supports sustainable development outcomes.

Reaching out to citizens through mobile, social media and inclusive multichannel service strategies

There is increasing expectation for easier access to more public information and public services from anywhere, anytime through multiple channels or citizen touch-points. The 2014 *Survey* shows that digital channels, with both their diversity and spread, are being increasingly adopted by almost all countries, while counter (face-to-face service) and telephone (voice) services, have continued to serve as fundamental channels.

In 2014, all 193 United Nations Member States have some form of online presence, as compared to 18 countries with no online presence in 2003 and three countries in 2012. Although the use of email increased only slightly between 2012 and 2014 to just over two-thirds of countries, it is likely to continue to grow in the future, especially for notification and information provision. Similar uses are seen for SMS via mobile devices, although still more than 80 per cent of countries have not yet exploited this potential mass channel which is only a slight advance from 2012. As far as the use of mobile phones themselves are concerned, there are today over 1.5 billion smart phones in use globally, and this is growing exponentially.

Between 2012 and 2014, the number of countries offering mobile apps and mobile portals doubled to almost 50 countries, where they are often used directly to support poverty eradication, gender equality and social inclusion, as well as promote economic development, environmental protection and disaster management. The use of social media by governments is also increasing fast with the number more than tripling from 2010 to 2012 and with another 50 per cent rise in 2014, so that today 118 countries use it for e-consultation and 70 for e-government generally. Both social media and mobile channels typically do not require high investment costs as they ride on consumerisation and non-governmental platforms, but they often need a business transformation and strong commitment in the public administration to maximise benefits.

There is also an increasing use of public kiosks from 24 countries in 2012 to 36 in 2014 for use as open-access facilities in public spaces and locations providing

free use of online services, especially in marginalised or remote areas and where the individual use of ICT is not widespread. Similarly, both over the counter and telephone services remain fundamental channels with the majority of countries providing at least some services using these routes. They are often seen as important supplements for individual problem solving compared to, for example, websites, which are generally better at providing information.

It is imperative for government managers to leverage the different advantages offered by various channels and find smart ways to increase usage of online services and reach out to disadvantaged and vulnerable groups for social inclusion. A multichannel approach in public service delivery is akin to a whole of government roadmap to e-government development and needs to be driven with a focused agenda and strong facilitation across all levels. Public service delivery can be greatly improved through a smart blend of channel mix, optimising the characteristics of different channels to satisfy diverse citizens' needs and having a consolidated view and analysis of channel performance.

The challenge of the digital divide

While initially the digital divide was considered primarily an issue of access to relevant information technology infrastructure, it is increasingly about capability and ability to access and use ICT. The digital divide arises from broad socio-economic inequality, and at the root of both are economic and social disparities between countries, groups and individuals which impact their ability to access and use ICT to promote well-being and prosperity. As such, the digital divide in one form or another affects people both in developed and developing countries.

Overall, despite some progress in providing a plethora of e-services and online information, efforts at mitigating the digital divide in any meaningful way have not reaped large dividends. Although meaningful access to ICT has gone beyond connectivity issues, e-government has still not yet adequately embraced human, economic and social resources, institutional structures and governance networks, which are central to developmental outcomes.

In recent years, policy makers have progressively focused on the link between use of new technologies, education and social inclusion, particularly of disadvantaged and vulnerable groups. By 2014, 64 per cent of the national government portals and websites provided integrated links to sources of archived information (policies, budget, legal documents, etc.) related to some disadvantaged and vulnerable groups, namely people living in poverty, persons with disabilities, older persons, immigrants and youth.

One aspect of the digital divide is also the e-government usage divide, which is generally correlated with demographic and socio-economic characteristics, such as income, education and age. Furthermore, as more government tasks are moved online, there is an increasing concern that a significant portion of the population will be shut off from jobs, health care, education and other government services. This is especially the case in a few of the most advanced e-government countries, for example in some European countries, with 'digital by default' strategies where many services are only available online largely driven by the cost savings governments can make, as well as the burden reductions which can be

achieved for all stakeholders. Clearly, this significantly boosts e-government usage, even though additional special provision needs to be made for groups and individuals who cannot get online.

Promoting usage is key to delivering development impacts

Leveraging e-government to deliver development impacts depends on effective usage. While the provision of e-government services on the supply side is generally increasing, improvements are also needed to the demand side of the equation, i.e. on e-government uptake. In the member countries of the Organisation for Economic Co-operation and Development (OECD), e-government usage averages out at 50 per cent, but there is great variation among countries and the use of more advanced services such as accessing and sending forms online is much less, especially as such services require robust security and payment systems. In developing countries these numbers are even lower. Countries' efforts to develop e-government therefore need to go hand in hand with their efforts to increase demand through usability features such as simplicity and personalisation, usage monitoring and tracking and user feedback and usage promotion. Indeed, many countries are doing this, although it is far from being the norm.

Increasing uptake is also dependent on aligning, mixing and integrating channels appropriate to specific service types and user groups. In this context, both mobile and social media are becoming more important both to deliver services and to interact with users in a variety of ways. This also helps government listen to and work with users and help design more appropriate, user friendly and useful services, which is in turn likely to increase take-up and impact. There are increasing examples where this is being done in sectors like education, health, poverty eradication, employment and environment, which directly support sustainable development through increased user uptake.

Policy to promote both supply side and demand side must go hand in hand. Policy efforts to increase take-up should, however, not aim just to increase usage, but should also focus on obtaining the maximum benefit from that usage for all stakeholders.

Open government data as a new development resource

The recent recognition of the importance of Open Government Data (OGD) in meeting the rights of individuals, businesses and civil organizations to access and use government information, to engage in policymaking, to improve existing public services as well as to co-create and even create new public services, is significant. Opening up government data is fundamentally about more efficient use of resources and improving service delivery. However, OGD has limited value if the data published is not utilized, which means involving stakeholders and focusing on developing sustainable ecosystems of users. Much more work also needs to be done in measuring and understanding the return on investment of OGD. Although early indications are positive on this point, precisely how successful use and business models operate remains at the experimental stage.

Data has always been a strategic asset for any organization, but its importance has exponentially grown in the last decade due to the enormous amount of data creation and advances in data collection, processing and analysis technologies. However, while the use of data in developed countries has made enormous progress in recent years, developing countries have made much less headway; therefore, they need to increase awareness, provide sufficient capacities and assist public officials with the implementation of open government data initiatives. In all countries, governments should focus even more on starting, growing and sustaining open data initiatives through updating their policy, legal and institutional frameworks as well as improving leadership and raising awareness at higher decision making levels. The amount of data that government agencies collect is likely to grow exponentially in the coming years. Although open data provides many opportunities and capabilities for government agencies, its real impact will not be realized without carefully planned data governance, both within the public sector as well as with appropriate non-public stakeholders.

The 2014 *Survey* introduced new questions related to OGD, including the existence of dedicated portals, the types of technical formats and location information, the availability of user guidelines and support and the possibility for users to propose new datasets. The 2014 *Survey* found that while many countries use government websites to share data, only 46 countries have dedicated data portals. Most main government sectors are making OGD available and most of this is in machine-readable format. Apart from the provision of OGD, there is a need to develop appropriate policy, legal and institutional frameworks to ensure that basic rights to information are available and well known. Since OGD initiatives require cooperation between various government agencies, strong political and top-level vision and management are essential. In addition, issues concerning data quality related to authenticity, integrity and re-use standards are important, as is data privacy and protection against misuse. Governments, therefore, need to ensure an appropriate balance between the need for privacy on the one hand and openness on the other.

Going forward

A post-2015 development agenda that is both unified in focus and universal in form is emerging, tackling poverty eradication and sustainable development. Such an agenda would have major implications for the expected role of e-government in supporting its implementation. As shown throughout the 2014 *Survey*, it is clear that e-government can contribute towards the post-2015 development agenda by strengthening national capabilities, enhancing governments' performance, increasing efficiency, effectiveness and inclusiveness of public services, promoting transparency and reducing corruption in the public sector, helping governments "go green", facilitating effective disaster management, favouring an enabling environment for economic growth, as well as promoting social inclusion through equitable access to services. Whole-of-government approaches, which are enhanced through ICTs, can promote integrated and inclusive service delivery. The application of ICT in government provides opportunities for multi-stakeholder engagement by strengthening collaboration mechanisms, both

within the public sector and with relevant actors outside, such as business, civil society, communities and individual citizens. It allows for broader participation in national and local policymaking and service delivery through new channels and modalities of communication.

The 2014 *Survey* shows that progress in e-government development has been attained through increased e-participation, growth of the mobile channel and social media, expanded usage and the burgeoning of open government data. However, although there are numerous inspiring exceptions, many challenges remain, such as low income, ongoing digital divides, the inadequacy of institutional change processes and lack of innovative e-government leadership. Addressing e-government challenges is often dependent on the national capacity for change and innovation, which itself largely determines the success of e-government goals. In the same vein, countries that have a more vibrant information society are able to better leverage human talent and ICT services for improved e-government performance.

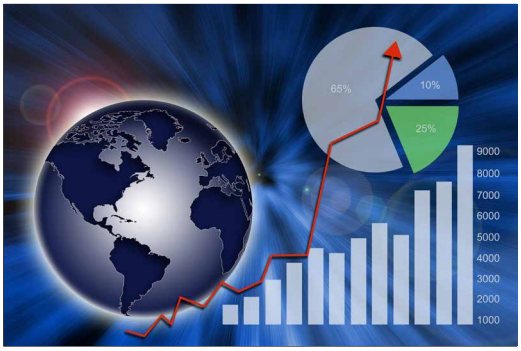
Based on good practices from around the world, the 2014 *Survey* highlights that effective e-government development depends on strong political will, collaborative leadership and new governance frameworks to support and manage a citizen centric service delivery model, including a national ICT policy and e-government strategy, as well as strengthening institutions and building the capacities of public servants. The effective approaches and modalities as well as the comparative advantage of the whole-of-government approach should be considered in forming the future framework for e-government development. Commitments to collaboration, openness, transparency, accountability and participation in national public governance, backed by robust ICT infrastructure, adequate human capital and online service delivery, are also of critical importance to the development of effective e-government for a sustainable and desirable future.

World e-government rankings

1.1. Introduction

It has been over a decade since the United Nations started assessing the global e-government development through the initiative[1] "Benchmarking E-government: Assessing the United Nations Member States" in 2001. Since then, there has been increasing evidence through public policy formulation and implementation that e-government, among others, has played an effective enabling role in advancing national development. At the same time, the *United Nations E-Government Survey* has gained wide acceptance as a global authoritative measure of how public administrations provide electronic and mobile public services. The biennial edition of the *United Nations E-Government Survey* aims to exemplify successful e-government strategies, pioneering practices with a view towards administrative reform and sustainable development.

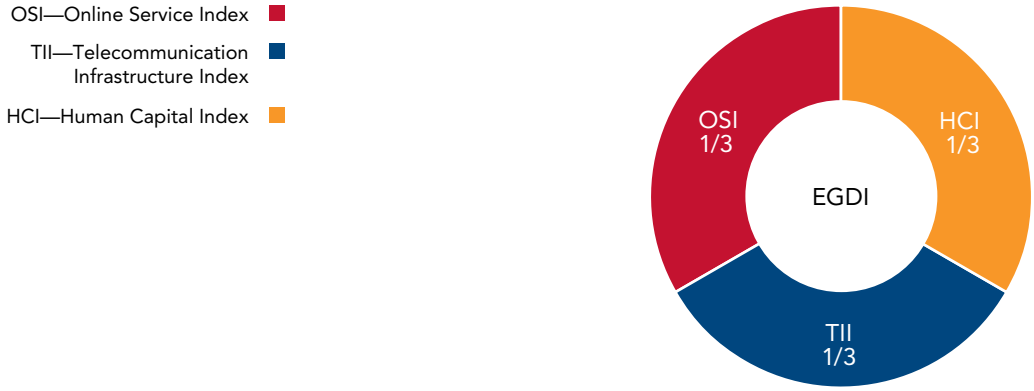
The conceptual framework of the E-Government Development Index (EGDI)[2] remains unchanged since its inception in 2001. Based on a holistic view of e-government development, the methodological framework has remained consistent across *Survey* periods, while at the same time its components are carefully adjusted to reflect evolving knowledge of best practices in e-government and changes in the underlying supporting ICT infrastructure, human capacity development and online service advancement, among other factors. The EGDI is a composite measure of three important dimensions of e-government, namely: provision of online services, telecommunication connectivity and human capacity, as illustrated in Figure 1.1. Each one of these sets of indices is in itself a composite measure that can be extracted and analyzed independently (see section on Survey Methodology). The global e-government ranking, as derived from the EGDI, is not designed to capture e-government development in an absolute sense; rather, it aims to give a performance rating of national governments relative to one another.



In this chapter:

Chapter 1

Figure 1.1. The three components of the E-Government Development Index (EGDI)



Chapter 1 presents an overview and broad analysis of the 2014 *United Nations E-Government Survey* data. It presents e-government development at the global and regional levels. It also analyzes the relationships of the EGDI in the Small Island Developing States (SIDS), the Landlocked Developing States (LLDS) and the Least Developed Countries (LDC) and explores the correlation of e-government with other indicators like national income.

1.2. Progress at a glance

The e-government story may not be new but it is entering a new episode. Lowering costs is still an important consideration in service delivery, but adding public value is gradually taking over as the primary goal of e-government. The view of an "e-government maturity model" no longer holds as e-government goals are constantly evolving to meet emerging challenges and increase public value. Emphasis is now being placed on deploying a portfolio of e-services that spans functions, business units and geographies, at varying local or municipal levels, thus increasing the value of service offerings to citizens by effectively adopting disruptive technologies in an adaptive and scalable manner.

In many countries, a new governance contract is emerging to support and manage the service delivery model. Collaborative service delivery is now pervasive, where governments, citizens, civil society and the private sector often work together to innovate processes and leverage new technologies. In meeting multi-faceted sustainability challenges, governments are, for example, increasingly using open data and data analytics to improve accuracy in forecasting citizens' demand of public utilities or to screen for irregularities in public procurement to lower its risks. Predictive analysis is also used to identify issues before problematic scenarios develop, and sentiment analysis is deployed in engaging citizens in public consultation and decision-making processes. This shift is observed in both developed and developing countries, with the focus on adding public value to people's lives in an inclusive manner.

1.2.1. Highlights of 2014 e-government rankings

Twenty-five countries have a "very high EGDI" with index values in the range of 0.75 to 1.00 (see Table 1.1). Following trends from past *Survey*s, 20 out of these 25 countries were also ranked among the top 25 in the 2012 *Survey*. In addition, the regional representation mirrors those of past *Surveys*, with a majority of 64 per cent (16 countries) from Europe, 20 per cent (5 countries) from Asia, 8 per cent (2 countries) from Americas and 8 per cent (2 countries) from Oceania. All top 25 are high-income nations, as defined by the 2012 World Bank Country Classifiaction (see section on Survey Methodology).

The Republic of Korea has retained the top spot in 2014 with its continued leadership and focus on e-government innovation. Australia (2nd) and Singapore (3rd) have both improved their rankings considerably over their 2012 performance.

Table 1.1. World e-government leaders (Very High EGDI) in 2014

Country	*Region*	*2014 EGDI*	*2014 Rank*	*2012 Rank*	*Change in Rank (2012–2014)*
Republic of Korea	Asia	0.9462	1	1	-
Australia	Oceania	0.9103	2	12	↑ 10
Singapore	Asia	0.9076	3	10	↑ 7
France	Europe	0.8938	4	6	↑ 2
Netherlands	Europe	0.8897	5	2	↓ 3
Japan	Asia	0.8874	6	18	↑ 12
United States of America	Americas	0.8748	7	5	↓ 2
United Kingdom	Europe	0.8695	8	3	↓ 5
New Zealand	Oceania	0.8644	9	13	↑ 4
Finland	Europe	0.8449	10	9	↓ 1
Canada	Americas	0.8418	11	11	-
Spain	Europe	0.8410	12	23	↑ 11
Norway	Europe	0.8357	13	8	↓ 5
Sweden	Europe	0.8225	14	7	↓ 7
Estonia	Europe	0.8180	15	20	↑ 5
Denmark	Europe	0.8162	16	4	↓ 12
Israel	Asia	0.8162	17	16	↓ 1
Bahrain	Asia	0.8089	18	36	↑ 18
Iceland	Europe	0.7970	19	22	↑ 3
Austria	Europe	0.7912	20	21	↑ 1
Germany	Europe	0.7864	21	17	↓ 4
Ireland	Europe	0.7810	22	34	↑ 12
Italy	Europe	0.7593	23	32	↑ 9
Luxembourg	Europe	0.7591	24	19	↓ 5
Belgium	Europe	0.7564	25	24	↓ 1
Very High EGDI Average		0.8368			
World Average		0.4712			

With an average of 0.8368, the top 25 countries are far ahead of the rest of the world (world average of 0.4721). One of the primary factors contributing to a high level of e-government development is concurrent past and present investment in telecommunication, human capital and provision of online services.

Figure 1.2. Percentage of countries grouped by EGDI

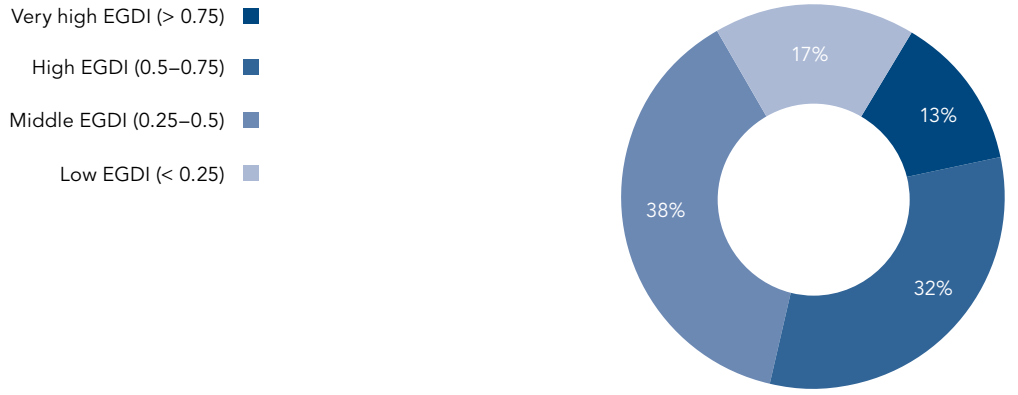


Figure 1.2 shows the breakdown of countries grouped by EGDI. While there are only 25 countries (13 per cent) ranked as very-high-EGDI (more than 0.75), the majority falls in the middle range, with 62 countries (32 per cent) ranked as high-EGDI (between 0.5 and 0.75) and 74 countries (38 per cent) ranked as middle-EGDI (between 0.25 and 0.5). The lowest performing group, ranked as low-EGDI (less than 0.25), consists of 32 countries (17 per cent). Table 1.2 shows the breakdown of each EGDI group. Some observations are:

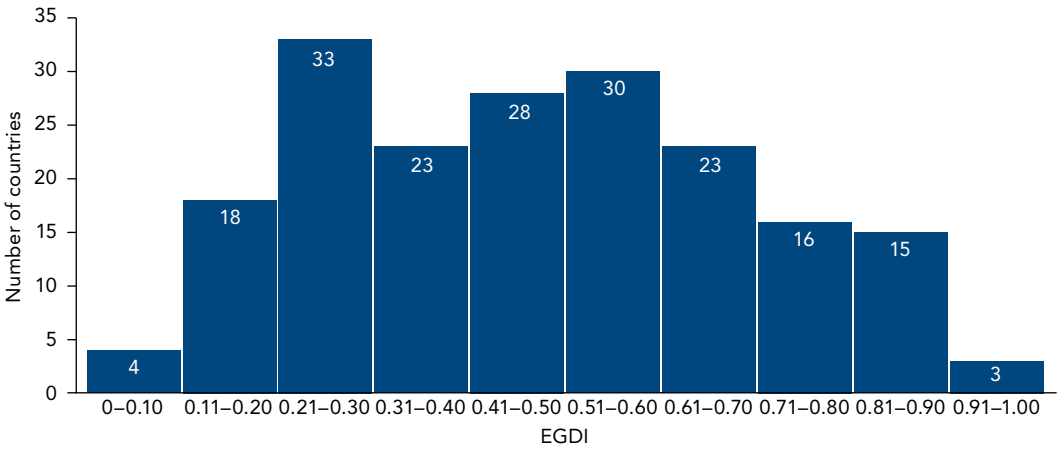
- There is a considerable opportunity for countries with high-EGDI and middle-EGDI to continue to advance their e-government development. With clear strategies, smart investment in ICT infrastructure, continued investment in primary, secondary and tertiary education, as well as through radical transformation in offering online public services, governments can achieve more to follow the upward trend.
- Among middle-EGDI countries, e-government services are increasingly delivered through mobile devices.
- Limitations in ICT infrastructure and human capacity pose the greatest challenge, particularly in low-EGDI countries with constraints of public resources. In low-EGDI countries, there is a shift towards intermediary channels, such as kiosks and postal offices, having bigger roles in facilitating access and driving usage of e-government services to disadvantaged and vulnerable groups.
- Low adult literacy rates in some middle-EGDI and low-EGDI countries, coupled with little education or low average years of schooling, pose a challenge that will prevent these countries from making significant advancements in e-government development.

Table 1.2. Countries grouped by EGDI in alphabetical order

Very High EGDI (More than 0.75)	*High EGDI (Between 0.50 and 0.75)*		*Middle EGDI (Between 0.25 and 0.50)*		*Low EGDI (Less than 0.25)*
Australia	Albania	Malaysia	Algeria	Marshall Islands	Afghanistan
Austria	Andorra	Malta	Angola	Micronesia	Benin
Bahrain	Antigua and Barbuda	Mauritius	Bahamas	Namibia	Burkina Faso
Belgium	Argentina	Mexico	Bangladesh	Nauru	Burundi
Canada	Armenia	Monaco	Belize	Nicaragua	Central African Republic
Denmark	Azerbaijan	Mongolia	Bhutan	Nigeria	Chad
Estonia	Barbados	Montenegro	Bolivia	Pakistan	Comoros
Finland	Belarus	Morocco	Bosnia and Herzegovina	Palau	Côte d'Ivoire
France	Brazil	Oman	Botswana	Paraguay	Congo
Germany	Brunei	Panama	Cambodia	Philippines	Djibouti
Iceland	Bulgaria	Peru	Cameroon	Rwanda	Equatorial Guinea
Ireland	Chile	Poland	Cape Verde	Saint Kitts and Nevis	Eritrea
Israel	China	Portugal	Congo	Saint Lucia	Gambia
Italy	Colombia	Qatar	Cuba	St Vincent and the Grenadines	Guinea
Japan	Costa Rica	Moldova	DPR of Korea	Samoa	Guinea-Bissau
Luxembourg	Croatia	Romania	Dominica	Senegal	Haiti
Netherlands	Cyprus	Russian Federation	Dominican Republic	South Africa	Liberia
New Zealand	Czech Republic	San Marino	El Salvador	Sudan	Malawi
Norway	Ecuador	Saudi Arabia	Ethiopia	Suriname	Mali
Republic of Korea	Egypt	Serbia	Gabon	Swaziland	Mauritania
Singapore	Fiji	Seychelles	Ghana	Syria	Mozambique
Spain	Georgia	Slovakia	Guatemala	Tajikistan	Myanmar
Sweden	Greece	Slovenia	Guyana	Thailand	Nepal
United Kingdom	Grenada	Sri Lanka	Honduras	TFYR of Macedonia	Niger
United States of America	Hungary	Switzerland	India	Timor-Leste	Papua New Guinea
	Jordan	Tunisia	Indonesia	Tonga	Sao Tome and Principe
	Kazakhstan	Turkey	Iran	Trinidad and Tobago	Sierra Leone
	Kuwait	Ukraine	Iraq	Turkmenistan	Solomon Islands
	Latvia	United Arab Emirates	Jamaica	Tuvalu	Somalia
	Liechtenstein	Uruguay	Kenya	Uganda	South Sudan
	Lithuania	Venezuela	Kiribati	Tanzania	Togo
			Kyrgyzstan	Uzbekistan	Zambia
			Laos	Vanuatu	
			Lebanon	Viet Nam	
			Lesotho	Yemen	
			Libya	Zimbabwe	
			Madagascar		
			Maldives		

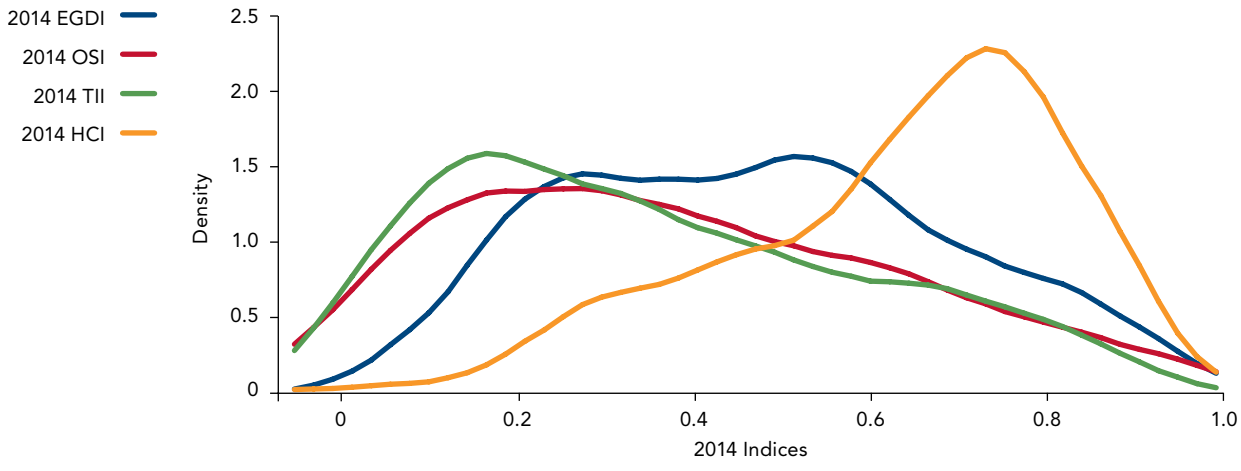
Despite global trends towards increased ICT connectivity and the increasing focus on deploying e-services for national development purposes, there remains a disparate distribution of e-government development among the 193 Member States. As illustrated in the histogram in Figure 1.3, among the countries with EGDI values lower than 0.5, the statistical distribution displays that the highest number of countries (33) fall between 0.21 and 0.30 EGDI.

Figure 1.3. Distribution of countries by EGDI, 2014



The disparities in the levels of EGDI among countries not only reflect the low levels of online services, infrastructure and human capital resources in several regions and countries of the world; they also highlight the magnitude of the existing gaps. Taking a closer look at the three components of EGDI, human capital scores are higher compared to the other two components, as shown in Figure 1.4. The lowest performing component is the Telecommunication Infrastructure Index (TII) which drags down the overall EGDI; while the Online Service Index (OSI) also trails in performance compared to the average value. One observation is that countries, in general, are putting more investment in human capital as compared to ICT infrastructure, perhaps because the former is also featured as a dominant factor in achieving the Millennium Development Goals and alleviating poverty.

Figure 1.4. Distribution of EGDI and its three components, 2014

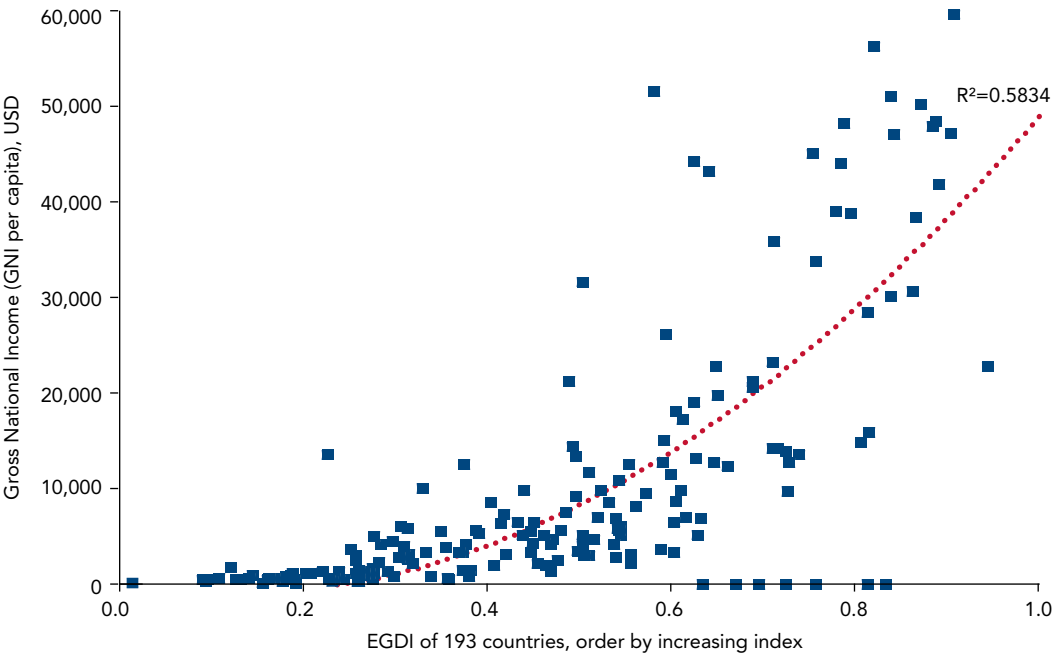


1.2.2. National income and e-government development

The income level of a country is a general indicator of economic capacity and progress, and thus has a strong influence on national e-government development. Access to ICT infrastructure and the provision of education, including ICT literacy, are highly related to the income level of a nation. The lack of these enabling factors places strong constraints on implementing e-government initiatives, even if sound policies and national strategies are in place. As a result, and despite efforts in some countries to offer online services, the full potential of e-government is far from being fully realized, particularly among the lower-middle income and low income countries, as evidenced by their poor EGDI performance.

However, it is clear that national income certainly does not, by itself, constitute or guarantee advanced e-government development, as evidenced by many outliers highlighted in Figure 1.5 and Figure 1.6. Some countries have significantly advanced their e-government development ranking despite their relatively low national income, just as there are many countries which are lagging despite their relatively high income and thereby have good opportunities for future improvement. The main enabler of good e-government progress is often putting in place an effective governance framework to support and manage a citizen-centric service delivery model, including a national ICT policy and e-government strategy, as well as strengthening institutions and building the capacities of public servants.

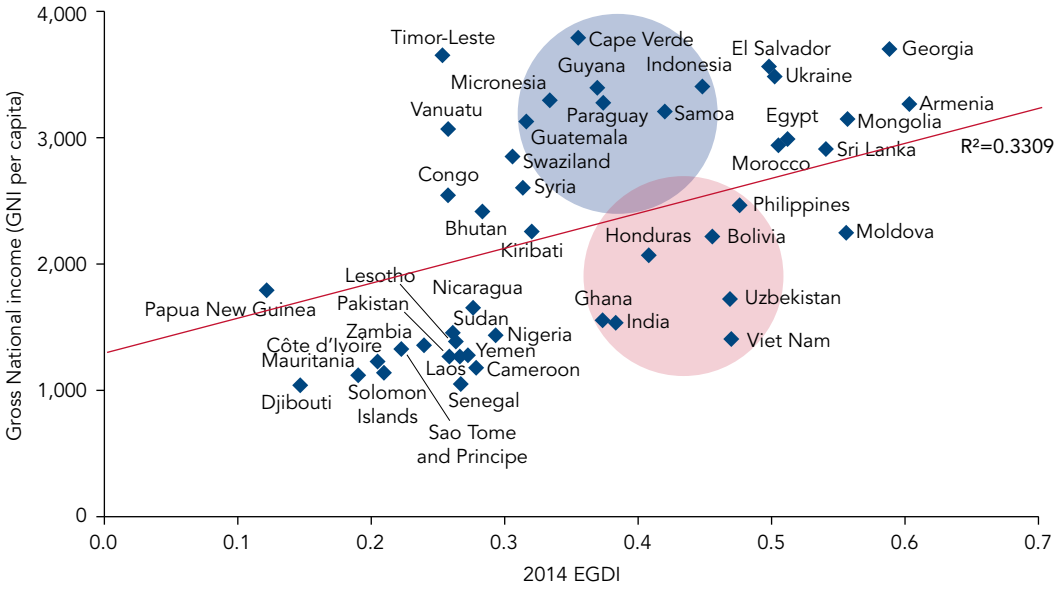
Figure 1.5. Relation between EGDI and national income (GNI per capita)



These trends reveal opportunities for countries that have not reached the level of e-government development, as have other countries in the same income group. For instance, among the lower-middle income countries, there is potential for quick advancement of countries like Cape Verde, Guatemala, Guyana, Micronesia, Paraguay, Samoa and Indonesia, as highlighted in Figure 1.6. At the same

time, some countries have clearly advanced their e-government despite their relatively lower national income. These countries include Bolivia, Ghana, Honduras, India, Philippines, Vietnam and Uzbekistan. Chapter 2 also looks at the relationship between income and online service delivery.

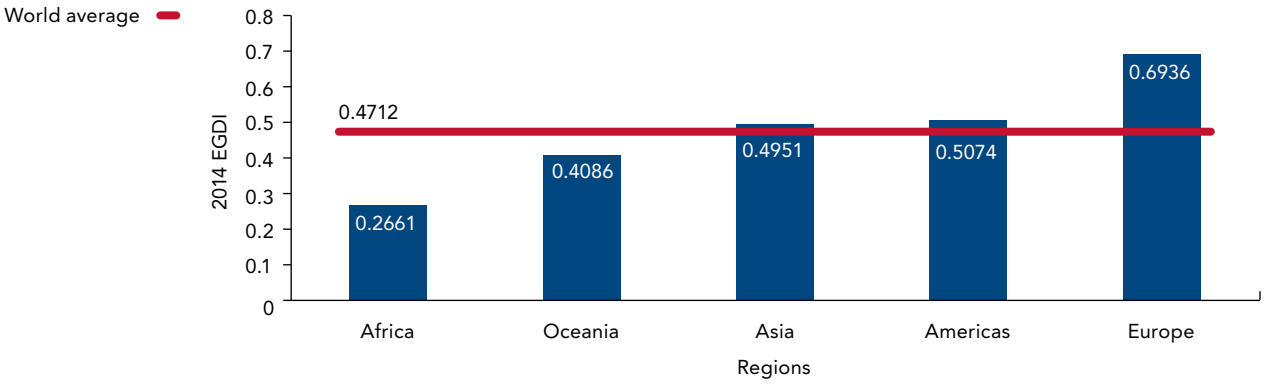
Figure 1.6. Relation between EGDI and national income (GNI per capita), lower-middle income countries



1.3. Regional development

Figure 1.7 illustrates the regional averages as compared to the world median of 0.4712 in 2014. In 2014, Europe (0.6936) continues to lead with the highest regional EGDI, followed by the Americas (0.5074), Asia (0.4951), Oceania (0.4086) and finally Africa (0.2661). Examining previous trends, there has been no change in regional positions since 2003.[3]

Figure 1.7. 2014 regional averages of e-government development



1.3.1. Africa

Progress in Africa remains relatively slow and uneven. The regional EGDI average in Africa is 0.2661. Six countries (Tunisia, Mauritius, Egypt, Seychelles, Morocco and South Africa) have EGDI values above the world average of 0.4712, placing them among the top 50 per cent of the world. On the other hand, about 30 per cent (16 countries) of the 54 African countries are at the bottom 10 per cent of the world ranking.

To reverse this trend, countries in the region need to focus on building human capital, including ICT literacy and on bridging infrastructure gaps to provide an enabling environment for e-government development. Visionary strategies and practical implementation plans should follow for effective deployment of sustainable online services.

Tunisia and Mauritus are the two highest-ranked countries in Africa, with Egypt, Seychelles, Morocco and South Africa following closely behind and showing progress as compared with the 2012 *Survey*. However, Africa as a whole exhibits a regional digital divide with most Internet activity and infrastructure concentrated in South Africa, Morocco, Egypt, Mauritius and Seychelles.

Table 1.3 shows the top 20 countries in the African region based on e-government development. Tunisia climbed 28 places to the 75th global position. Mauritius and Seychelles remain in the regional top 5, improving their world rankings from 93rd in 2012 to 76th in 2014 and from 84th to 81st respectively. Egypt improved its ranking significantly and is now ranked third in the region and 80th globally. Morocco improved its rank by 38 places, which is clearly the biggest jump in the region; it has emerged as a trailblazer in certain areas with particularly impressive mobile broadband take-up. Morocco was one of the first countries in the Middle East and North Africa to institutionalize a regulatory environment for promoting competition in the telecommunications sector; and as such, made great strides in levelling the playing field for private operators to enter and succeed in the market. As early as 1999, a national strategy was developed to lay out the country's ICT vision which later became the foundation for subsequent plans such as e-Morocco and now Digital Morocco (see Boxes 1.1 and 1.2 for case studies on Morocco and Mauritius).

The telecommunication sector has been an important driver of Africa's economic growth in recent years. ICT revenues have increased at a compound annual growth rate of 40 per cent in Africa and the number of mobile subscribers exceeded 400 million in 2011. To meet the increased demand, investment in telecommunication infrastructure—about $15 billion a year—has also grown considerably, with a 33 per cent compound annual growth rate from 2003 to 2008.[4] The increase in revenue generation in Africa has mostly been due to the exponential usage increase of mobile technologies and related services. Africa's average annual growth rate in mobile subscriptions was estimated in 2012 at 65 per cent or higher, making it the highest in the world.[5] Mobile value-added services have also been launched by both public and private sectors throughout the continent to enable and support a broad range of sectors, including food security, agriculture, banking, a broad range of education and healthcare, among others.

Table 1.3. Top 20 countries in Africa

Country	*Level of Income*	*EGDI*	*2014 Rank*	*2012 Rank*	*Change in Rank*
		High EGDI			
Tunisia	Upper Middle	0.5390	75	103	↑ 28
Mauritius	Upper Middle	0.5338	76	93	↑ 17
Egypt	Lower Middle	0.5129	80	107	↑ 27
Seychelles	Upper Middle	0.5113	81	84	↑ 3
Morocco	Lower Middle	0.5060	82	120	↑ 38
		Middle EGDI			
South Africa	Upper Middle	0.4869	93	101	↑ 8
Botswana	Upper Middle	0.4198	112	121	↑ 9
Namibia	Upper Middle	0.3880	117	123	↑ 6
Kenya	Low	0.3805	119	119	-
Libya	Upper Middle	0.3753	121	191	↑ 70
Ghana	Lower Middle	0.3735	123	145	↑ 22
Rwanda	Low	0.3589	125	140	↑ 15
Zimbabwe	Low	0.3585	126	133	↑ 7
Cape Verde	Lower Middle	0.3551	127	118	↓ 9
Gabon	Upper Middle	0.3294	131	129	↓ 2
Algeria	Upper Middle	0.3106	136	132	↓ 4
Swaziland	Lower Middle	0.3056	138	144	↑ 6
Angola	Upper Middle	0.2970	140	142	↑ 2
Nigeria	Lower Middle	0.2929	141	162	↑ 21
Cameroon	Lower Middle	0.2782	144	147	↑ 3
Regional Average		**0.2661**			
World Average		**0.4712**			

Despite this phenomenal growth, there are challenges for strategic e-government development. Governments may need to play a greater role in navigating effective policies to reduce access costs for mobile broadband; support private collaboration; encourage innovative business models that drive employment such as micro-work and outsourcing; and support ICT entrepreneurship. Connectivity and digital divide issues should also be given more attention in the region, given the fact that in rural locations, where 65 to 70 per cent of Sub-Saharan Africa's population currently resides, connectivity is still nearly non-existent.[6] Regional cooperation mechanisms could be strengthened to facilitate national development goals, particularly among those countries with no direct sea access (see section on Landlocked Developing Countries).

While the general e-government trends in Africa seem to be inclined toward mobile government initiatives and social media strategies, it is also advisable for policymakers to explore e-government on a more fundamental level through adjusting legislation and policies to encompass technology in national development strategies and welcoming new ideas and ways of connecting with citizens.

Box 1.1. Case study on citizen consultation in Morocco

Morocco's regional leadership can be attributed to its comprehensive government portal. As part of the government's effort to bring state of the art e-services to its citizens and include them in the decision making process, the government developed an e-consultation platform through the website of the *Secrétariat Général du Gouvernement*, where citizens can access legislative texts online, read and download them and post their comments and concerns. In this way, the government presents to its citizens a transparent, inclusive and easy channel through which they can share their concerns and make their voices heard; hence enriching democratic governance processes in the country.

The government also presents its responses to citizens' comments and provides feedback; showing that they track the concerns and remarks of citizens, take them into consideration and deliver a response.

Source: http://www.sgg.gov.ma

Box 1.2. Case study on the Small Island Developing State of Mauritius

The government of Mauritius has put effort into developing their online portal and their telecommunication infrastructure. Their website www.gov.mu offers citizens an exhaustive list of e-services segmented by target persons (139 services), by domain (59 services), by ministry (53 services), by department (13 services) and parastatally (14 services).

Even though Mauritius is one of the Small Island Developing States with a small land area and population, its economy has developed since independence from a small-scale focus based on agriculture, to a diversified middle-income economy. This increased the government's potential to invest in infrastructure, communications and education, which raised the Human Capital Index of Mauritius and in turn raised its ranking in the regional EGDI.

The government portal also offers citizens a platform for e-participation through chat rooms, a media library, blogs and discussion forums.

Sources: http://www.gov.mu/English/Pages/Media.aspx, https://www.gov.mu/English/E-Services/Pages/default.aspx

1.3.2. Americas

The top performing countries in the Americas region are the United States and Canada, both of which are also among the world leaders. Table 1.4 displays the top 20 countries in the Americas region. As in the recent past, the regional EGDI for the Americas is above the world average score, with most of its countries concentrated in the first 100 positions of the ranking. Central American and Caribbean countries are still located in the lower half of the ranking, however, reflecting the clear divide between these subregions and the rest of the Americas (see also Box 1.8 in the Small Island Developing States section.)

Since 2012, the United States of America has taken important steps to drive technology towards sustainable growth and quality jobs through policies that support

innovation and education. It has also customized its digital agenda to fit the new tendencies and needs of its citizens, such as cloud computing, smart mobile devices, tablets and high speed networks. Uruguay, widely recognized as the country in the South with the largest per capita export of software,[7] has demonstrated great progress in EGDI and its components between 2012 and 2014, with online services increasing by 55 per cent and telecommunication infrastructure improving by 27 per cent. Even though the country is recognized by the high quality of its tertiary education system in the areas of technology and computing, its Human Capital Index has decreased by 10 per cent. Haiti is still at the bottom of the ranking, but is demonstrating some improvements. In 2012, the EGDI was 0.337 points lower than the world average, whilst in 2014 the country has slightly reduced the gap with a difference of 0.2903. Haiti has faced major difficulties in the past which hinder its development, including the major earthquake in 2010.

Table 1.4. Top 20 countries in the Americas

Country	*Level of Income*	*EGDI*	*2014 Rank*	*2012 Rank*	*Change in Rank*
Very High EGDI					
United States of America	High	0.8748	7	5	↓ 2
Canada	High	0.8418	11	11	-
High EGDI					
Uruguay	High	0.7420	26	50	↑ 24
Chile	High	0.7122	33	39	↑ 6
Argentina	Upper Middle	0.6306	46	56	↑ 10
Colombia	Upper Middle	0.6173	50	43	↓ 7
Costa Rica	Upper Middle	0.6061	54	77	↑ 23
Brazil	Upper Middle	0.6008	57	59	↑ 2
Barbados	High	0.5933	59	44	↓ 15
Antigua and Barbuda	High	0.5927	60	49	↓ 11
Mexico	Upper Middle	0.5733	63	55	↓ 8
Venezuela (Bolivarian Republic of)	Upper Middle	0.5564	67	71	↑ 4
Peru	Upper Middle	0.5435	72	82	↑ 10
Panama	Upper Middle	0.5242	77	66	↓ 11
Grenada	Upper Middle	0.5220	78	75	↓ 3
Ecuador	Upper Middle	0.5053	83	102	↑ 19
Middle EGDI					
El Salvador	Lower Middle	0.4989	88	74	↓ 14
Saint Kitts and Nevis	High	0.4980	90	81	↓ 9
Trinidad and Tobago	High	0.4932	91	67	↓ 24
Bahamas	High	0.4900	92	65	↓ 27
Regional Average		**0.5074**			
World Average		**0.4712**			

Despite rapid improvement, South America, Central America and the Caribbean face some challenges regarding their online service delivery. Firstly, the infrastructure gap and broadband quality at the national level constrain access to online service. Countries like Costa Rica, El Salvador, Honduras and Belize have their Telecom Infrastructure Index pulling down their overall EGDI values. Mexico's TII is very low relative to its other components, a decrease which might be partially explained by the new subcomponent (wireless broadband) added to the index. In Mexico only 9.83 inhabitants out of 100 have wireless broadband subscriptions, compared to the world average of 23.57 subscriptions per 100 inhabitants. Second, a gap in complementary assets, like IT education or computer literacy, creates deficits in human resources, business management and research and development for the telecommunications sector. The Human Capital Index for North America is much higher than the HCI for all the other sub regions: Canada and the United States of America have an average Human Capital Index of 0.9170 while in the rest of the continent this index oscillates around 0.70.

In general, institutional weaknesses in the design of policies, the organization of programs and stakeholder coordination jeopardize the long term development of e-government practices. The countries with higher rankings have already overcome the process of providing clarity about the institutional setting for e-Government. The Online Service Index of Central America (0.4006) is lower than the rest of the region, however, it is still higher than the world OSI average (0.3919).

Furthermore, the region, especially South America and the Caribbean, has shown vast improvement in most economic and social indicators since the debt crisis of the early 1980s. This progress echoed a significant improvement in the living conditions of the population. However, the region now faces uncertainties of sustainable growth while overcoming constraints that characterize its productive structure.[8] ICT, like other general purpose technologies before it, can help modernize and revitalize traditional productive activities. Thus, governments in the region are now paying greater attention to the concept of e-government and its benefits for national sustainable development.

New ICT networks and platforms being developed by both public and private sectors are dramatically changing business models and public service delivery. Countries in the region can now take advantage of the new and growing demand for ICT goods and services in the public and private sectors to leverage the consolidation and emergence of better governance. In South America and the Caribbean the total ICT goods imported during the period of 2010 to 2012 grew by 3 per cent, whilst these imports grew only by 1.9 per cent for the entire world.[9] Faced with sustainability issues and fast growing markets, the region may leverage the ICT sectors to provide better solutions and efficient services. The government of Trinidad and Tobago, for instance, has introduced a new online portal to facilitate business and trade, transforming national industries, businesses dynamism and competitiveness.[10]

The e-government development in the region has also benefited from Small and Medium Enterprises (SMEs) that represent the majority of private enterprises, accounting for 99 per cent of businesses and employing 67 per cent of employees

in 2013.[11] E-procurement opens up new opportunities for micro and small businesses, and provision of open government data can greatly facilitate urban services, as the Americas region has a fast growing population with large concentrations in urban areas. For example, Rio de Janeiro is developing an e-government and open data project to forecast natural disasters in the city and undertake surveillance in preparation for global events such as FIFA World Cup and Olympic Games.

Collectively as a region, benefits can be reaped through e-government to enhance inclusion, transparency, accountability and cross-jurisdictional efficiency and contribute to its sustainable development (see Box 1.3).

Box 1.3. The potential of e-Government development in Latin America

Source: DPADM, http://www.unpan.org/

a) Center for Innovation on e-Government Development in Colombia

The Centre for Innovation on e-Government Development was established by the Government of Colombia together with UNDESA and UNDP in 2013. The Center promotes an e-government implementation framework that goes well beyond technology. It aims at the creation of a knowledge base, identification of trends and best practices in e-government to improve the performance of public institutions at international, regional, national and local levels. The project also aims at the development and promotion of a sustainable model to be extended to broad audiences, including innovation services not only as part of an institution, but also on the web through the virtual innovation centre.

Source: http://www.agesic.gub.uy/innovaportal/v/1454/1/agesic/guia_de_uso_de_la_plataforma_de_ge_del_estado_uruguayo.html; http://agesic.gub.uy/innovaportal/v/387/1/agesic/areas_de_la_agencia.html

b) Agency for e-Government development in Uruguay

The Agency for e-Government development of Uruguay promotes wide access to ICT; the acquisition of skills and knowledge to achieve greater social integration and better-equipped young people for the future; provides innovative solutions to improve services and quality of care that is given to society, simplifies procedures and processes; and provides user support regarding consultations and initiatives related to the areas of competence of the Agency. It also strengthens links with academia, civil society and international organizations with similar purposes; issues and proposes policies, rules and standards; enhances the synergy between state and businesses; and promotes the development of national software.

The Uruguayan E-Government Platform has the general goal of enabling and promoting the development of e-government services in Uruguay. The platform, which follows a two-pronged approach, consists of an Interoperability Platform and a set of Crosscutting Services. It implements a service-oriented architecture, leveraging the Web Services technology, to expose, use and combine government functionality implemented by public agencies. The platform is a key enabler for developing a joined-up e-government approach in Uruguay.

1.3.3. Asia

Comprising 30 per cent of the world's land area, with approximately 4.3 billion people, Asia is the largest continent and the most populous. With such diversity, the countries in Asia also exhibit varying levels of online presence and development; with the Republic of Korea leading the world ranking at number one in the 2014 *Survey*, and other countries like Afghanistan, Myanmar, Timor-Leste and Pakistan trailing among the bottom 30 countries globally.

As illustrated in Table 1.5, the Republic of Korea, with its developed telecommunications infrastructure, strong national education policy and high GDP per capita of $22,590 US dollars in 2012,[12] took the lead globally in e-government ranking for the first time in 2010 and is again the top performer in 2014 ahead of many other developed nations. The government started implementing its Advancement of e-Government Strategy in 2007, reaching a fully digitized public administration with advanced Government-to-Citizen (G2C) and Government-to-Business (G2B) service delivery and multi-channel communication and transactions. By having an adequate and necessary infrastructure for IT development and sustainability, the Republic of Korea established a world-class transparent and efficient online presence and an equally impressive e-mobile presence, both of which serve to maintain its vanguard position and help develop more citizen-centric strategies and projects in e-governance in the future.

Singapore, which ranked second in Asia, has shown significant improvement over the last two years, jumping from 10th place globally to 3rd, followed by Japan with improvement from 18th to 6th ranking globally. Bahrain, Kazakhstan, Saudi Arabia and Oman improved in the global rankings with 18th, 28th, 36th and 48th places respectively. Six out of the top 10 countries in the Asian region itself are in Western Asia where most of the improvements have been witnessed; two of the top 10 countries are in Eastern Asia, one in South-Eastern Asia and one in Central Asia as Kazakhstan remained that sub-region's leader in e-government.

Countries in Eastern Asia in general rank higher than the world average for various reasons such as e-government leadership, inclusive e-participation policies, broad-ranging e-services and extensive open government data portals. The Republic of Korea and Japan have exhibited an upward trend in e-government, enabled primarily by their developed infrastructure, their high literacy rates—especially IT literacy—and their developed economies. The Government of Japan established the New IT Reform Strategy with the goal of reducing the percentage of national and local government paperwork, such as applications and form submissions performed online, to at least 50 per cent by 2010. Thus, this initiative allowed almost all applications and other forms used by the national government to be submitted online, accompanied by a dissemination strategy to inform the public about such e-services. The Japanese government also expanded this strategy to include transactions between the local and national governments and businesses.[13]

Ranked 6th in Asia in general and first in Central Asia, Kazakhstan is the only country in Central Asia to show improvements between 2012 and 2014; jumping from a global ranking of 38th in 2012, to 28th in 2014. Uzbekistan came in second

place but dropped from 91st place to 100th globally. This decline in ranking in all Central Asian countries, with the exception of Kazakhstan, has been a trend in the sub-region since 2008; it could be attributed to insufficient development of telecommunication infrastructure and online presence.

Table 1.5. Top 20 countries in Asia

Country	*Level of Income*	*EGDI*	*2014 Rank*	*2012 Rank*	*Change in Rank*
		Very High EGDI			
Republic of Korea	High	0.9462	1	1	-
Singapore	High	0.9076	3	10	↑ 7
Japan	High	0.8874	6	18	↑ 12
Israel	High	0.8162	17	16	↓ 1
Bahrain	High	0.8089	18	36	↑ 18
		High EGDI			
Kazakhstan	Upper Middle	0.7283	28	38	↑ 10
United Arab Emirates	High	0.7136	32	28	↓ 4
Saudi Arabia	High	0.6900	36	41	↑ 5
Qatar	High	0.6362	44	48	↑ 4
Oman	High	0.6273	48	64	↑ 16
Kuwait	High	0.6268	49	63	↑ 14
Malaysia	Upper Middle	0.6115	52	40	↓ 12
Georgia	Lower Middle	0.6047	56	72	↑ 16
Cyprus	High	0.5958	58	45	↓ 13
Armenia	Lower Middle	0.5897	61	94	↑ 33
Mongolia	Lower Middle	0.5581	65	76	↑ 11
Azerbaijan	Upper Middle	0.5472	68	96	↑ 28
China	Upper Middle	0.5450	70	78	↑ 8
Turkey	Upper Middle	0.5443	71	80	↑ 9
Sri Lanka	Lower Middle	0.5418	74	115	↑ 41
Regional Average		**0.4951**			
World Average		**0.4712**			

Sri Lanka ranks first in Southern Asia, with the Maldives ranking in second position. The Sri Lankan government has made a substantial effort to develop its online portal which now ranks 74th in the world. The online portal offers A-Z government web indexes, 108 e-services for citizens, 51 e-services for businesses and 10 non-residence related e-services. The portal also offers extensive mobile and SMS services, an e-participation portal, government forms easily accessible online, a developed open data portal with data available in various formats, as well as a whole-of-government strategy (see Box 1.4).

Box 1.4. Sri Lanka's One for All

Sri Lanka's e-government policies have been geared towards including all segments of the population and offering services to everyone, regardless of their IT literacy levels or access to the internet. With mobile usage rates in the country exceeding 100 per cent and even the poorest people today having cell phones, albeit basic, Sri Lanka offers many m-government services.

The Government Information Center (GIC) is now providing more than 65 online services through basic phones calls, such as train schedules, job opportunities abroad, flight schedules, exam results, economic indicators, medical services and contact details.

Even though the IT literacy rates jumped from 9.7 per cent in 2004 to 40 per cent in 2012, the numbers are still not high enough to allow maximum utilization of the e-services the government provides. With the GIC, all-inclusive e-services can be delivered to the rich and poor alike and hence everyone can become a beneficiary of the digital advancement in government.

This new policy of inclusiveness and outreach towards the general population helped Sri Lanka improve in e-government service delivery and to jump from 115th rank in EGDI in 2012 to 74th in 2014.

Source: http://www.gic.gov.lk/

The e-government leader in South-Eastern Asia remains Singapore. Singapore's small population and land area, accompanied by a very high HDI of 0.895[14] and high GNI per capita (U.S. $47,210)[15]—allow the government sufficient resources to develop its online portal and offer its citizens, businesses and visitors, advanced e-services and extensive information; thus creating a one-stop-shop service delivery portal. Additionally, the high mobile and smartphone penetration rate in Singapore enables the government to provide e-access to citizens through a seamless "mGovernment" application, allowing faster, easier and more convenient use of available online resources; especially accessing forms and conducting G2C and G2B transactions.

Singapore has also developed a multi-agency programme led by the Ministry of Finance called ACE (Alliance for Corporate Excellence), grouping together systems and operation environments for human resources, finance and procurement into a common shared system. This enables government entities to share knowledge, data and best practices in a more straightforward and timely way, thus creating a cost-efficient G2G interactive flow that produces economic benefits. The financial and human cost savings of the ACE programme will not only benefit the government, but also citizens, by providing time-efficient and cost-saving services that are only possible with appropriate IT development.

Israel ranks 17th globally and 1st in Western Asia. The Israeli government portal offers services geared towards citizens, the private sector and tourists wishing to visit the country, as well as students and members of the Jewish Diaspora. The portal also offers online forms and a forum for G2C and C2G interaction and discussions; many online payments can be made through the portal and a section teaching simple Hebrew phrases can be found on the main page.

Within the Gulf Cooperation Council (GCC) countries, Bahrain ranks 18th globally, followed by the United Arab Emirates, Saudi Arabia, Qatar and Oman. Bahrain has set-up a Supreme Committee for Information and Communication Technology (SCICT) and the e-Government Authority was established to provide direction in developing and implementing a comprehensive e-Government strategy.[16] The country also held the Bahrain International e-Government Forum in Manama in April 2013, dealing with innovation and open data, mobile trends, cloud computing and shared services, social networks and e-Government.[17]

All six GCC countries rank within the top 10 in Western Asia, due to their high GDP, high literacy rates, small populations and a keen desire by their respective governments to invest in and develop their online national portals, and subsequently offer their citizens advanced e-services and information accessible in an effortless way. All members of the GCC have their online portals linked to one another, allowing their citizens easier navigation and access. This new initiative will stimulate the public sector to deliver more transparent and high-efficiency services, hence adopting a citizen-centric approach with the needs of the citizen, as a client, in the forefront.

The six GCC countries have established a GCC e-Government committee and organized the GCC e-Government Conference, providing a platform for the leaders to discuss the various aspects of the e-Government programmes in their countries, to share and benefit from each other's experience and enhance their respective e-Transformation processes. Their common goal is to enhance their e-Services, increase the productivity and efficiency of government and improve their ranking in the global e-Government *Surveys*[18] (see Table 1.6).

Table 1.6. E-government development of Gulf Cooperation Council (GCC)

Country Name	*Organization*	*EGDI 2014*	*2014 Rank*	*2012 Rank*	*Change in Rank*
Very High EGDI					
Bahrain	GCC Member	0.8089	18	36	↑ 18
High EGDI					
United Arab Emirates	GCC Member	0.7136	32	28	↓ 4
Saudi Arabia	GCC Member	0.6900	36	41	↑ 5
Qatar	GCC Member	0.6362	44	48	↑ 4
Oman	GCC Member	0.6273	48	64	↑ 16
Kuwait	GCC Member	0.6268	49	63	↑ 14
Regional Average		**0.6838**			
World Average		**0.4712**			

1.3.4. Europe

Europe continues to be the global leader in e-government development. However, in the previous ranking seven out of top ten countries were European, this time four European countries are in the top ten (see Table 1.7). Nevertheless, 11 out of the top 20 countries and 26 out of the top 40 countries are European. The on-going financial crisis, low growth, unemployment and aging population has led Europe to actively seek innovative solutions in order to remain competitive, restore growth and to be able to continue to offer a wide-range of public services to citizens. Despite the challenging times, the majority of the governments in the region report that the crisis has not had an impact on their level of e-government spending with some like Estonia, Germany, the Netherlands, Slovakia, Slovenia and Switzerland having even increased their e-government investments. This can be attributed to their support for e-government implementation as a key strategic tool to achieve wider public governance goals that support economic recovery and serve citizens.

Table 1.7. Top 20 countries in Europe

Country	*Level of Income*	*EGDI*	*2014 Rank*	*2012 Rank*	*Change in Rank*
		Very High EGDI			
France	High	0.8938	4	6	↑ 2
Netherlands	High	0.8897	5	2	↓ 3
United Kingdom	High	0.8695	8	3	↓ 5
Finland	High	0.8449	10	9	↓ 1
Spain	High	0.8410	12	23	↑ 11
Norway	High	0.8357	13	8	↓ 5
Sweden	High	0.8225	14	7	↓ 7
Estonia	High	0.8180	15	20	↑ 5
Denmark	High	0.8162	16	4	↓ 12
Iceland	High	0.7970	19	22	↑ 3
Austria	High	0.7912	20	21	↑ 1
Germany	High	0.7864	21	17	↓ 4
Ireland	High	0.7810	22	34	↑ 12
Italy	High	0.7593	23	32	↑ 9
Luxembourg	High	0.7591	24	19	↓ 5
Belgium	High	0.7564	25	24	↓ 1
		High EGDI			
Russian Federation	High	0.7296	27	27	-
Lithuania	High	0.7271	29	29	-
Switzerland	High	0.7267	30	15	↓ 15
Latvia	High	0.7178	31	42	↑ 11
Regional Average		**0.6936**			
World Average		**0.4712**			

E-government and online service delivery are increasingly seen in the region as a means to reduce costs while providing better and more user-friendly services to citizens and businesses, as well as being a part of the governments' efforts to go green. There is a renewed focus on the impact and cost-effectiveness of e-government in the region with countries such as the United Kingdom, the Netherlands and Denmark having implemented ambitious e-government efficiency and effectiveness programmes. The United Kingdom has embarked on a number of high profile initiatives to reduce the upfront expenditure on e-government whilst increasing its impact. The country makes 'digital efficiency' calculations and has established a Government Digital Service, a new team within the Cabinet Office tasked with transforming government digital services through an investment of US $113 million per year to be offset by multiple savings, such as saving US $5.9 billion by cutting the costs of paying work and pension benefits online. The Netherlands has already met the ambitious goal it set in 2004 to reduce the country's overall administrative costs by 25 per cent and is aiming for a further overall government saving of US $1.8 billion by 2018 through an e-government enabled whole-of-government approach. An important element of the e-government programme of the Netherlands is the Digital by Default strategy designed to move as many services to citizens and businesses as possible online. The Digital by Default approach was also adopted by the United Kingdom in its Government Digital Strategy 2012 and is guided by the principle of redesigning online services to make them more direct and convenient for all citizens.[19]

At the regional level, Europe focuses its e-government efforts to tackle the financial crisis through the European Commission's Digital Agenda for Europe (DAE) and the eGovernment Action Plan 2015. The e-government strategies of the 28 European Union (EU) Member States, as well as to some extent those of non-Member States in the region, are influenced by the DAE pillars of the digital single market, interoperability and standards, trust and security, fast and ultra-fast Internet access, research and innovation, enhancing digital literacy, skills and inclusion and ICT-enabled benefits for EU society, as well as seven additional key areas unveiled at the end of 2012. The success of the DAE and the Action Plan (see Box 1.5) can be attributed to a long-term approach to e-government development, embedding it into wider socio-economic development frameworks and not seeing e-government as a stand-alone nor primarily technical activity. Also important is the voluntary commitment of the EU countries to work together in a mutually supportive form of cooperative competition in moving towards common goals through the Open Method of Coordination approach. With their focused e-government efforts through the DAE and the Action Plan, the EU countries rank high in the e-Government Development Index with 15 countries out of the 28 EU countries being in the global top 30 (see Table 1.8).

As a pioneer of e-government, the usage of online services in the EU is relatively high. The target for the EU as set out in the DAE is that 50 per cent of the adult population will be using e-government services by 2015. This goal is well on its way to being achieved with 46 per cent of EU citizens reporting their use of online public services, citing flexibility, saving time and money and simplification as the main benefits.

Box 1.5. Digital Agenda for Europe and the European e-Government Action Plan

In 2010 the two main pillars of Europe's e-government strategy were launched with the Digital Agenda for Europe (DAE) and the 2011–2015 eGovernment Action Plan. The DAE is an integral part of the Europe 2020 Strategy to achieve smart, sustainable and inclusive growth. The aim of the DAE is to help reboot Europe's economy and to ensure that citizens and businesses get the most out of digital technologies. One of the priority areas of the DAE is ICT-enabled benefits for society including e-government. The DAE also provides a Digital Agenda Scoreboard for progress assessment at EU and national levels in achieving the 78 Digital Agenda actions set for the European Commission and 23 actions for the countries. The closely linked eGovernment Action Plan identifies four priorities that e-government should support, namely empowerment of citizens and businesses, further construction of Europe's digital single market, efficiency and effectiveness of government and implementation of the above through key enablers and the necessary legal and technical preconditions including interoperability. The impact of the DAE and the Action Plan has been significant with the majority of the over thirty countries participating -EU Member States as well as other European countries—having achieved success in meeting the requirements and goals and with strong support for the overall process. It is estimated that the full implementation of the DAE would increase GDP in Europe by 5 per cent, or by 1500€ per person over the next eight years by increasing investment in ICT, improving eSkills levels of the labour force, enabling public sector innovation and by reforming the framework conditions for the internet economy. In terms of jobs, up to one million digital jobs risk going unfilled by 2015 without pan-European action while 1.2 million jobs could be created through infrastructure construction.

Source: European Commission, Digital Agenda for Europe http://ec.europa.eu/digital-agenda/

The concerted and holistic efforts of Europe at both regional and national levels have helped to consolidate the position of Europe as the global leader in e-government. While there is some shifting in the ranking within the region, Northern and Western Europe continue to take the lead with seven countries out of the global top 20 being from Northern Europe and two out of the global top five being from Western Europe, while countries in other sub-regions have also made significant improvements. All the five Nordic countries (Finland, Sweden, Norway, Denmark and Iceland) are in the global top 20 and seven out of the top ten regional performers are from Northern Europe. Spain has made significant gains, improving its position from 23rd to 12th in the global ranking and from 15th to 5th in the European ranking. This improvement is the result of long-term e-government planning. In 2005, the country unveiled the Plan Avanza, its first information society strategy and in 2010 Plan Avanza 2 was launched aimed at positioning Spain as a leader in the use of advanced ICT products and services.[20] Other countries that made significant progress include Ireland that went up from 34th to 22nd in the global ranking, Italy from 32nd to 23rd (see Box 1.6), Latvia from 42nd to 31st, Montenegro from 57th to 45th and Belarus from 61st to 55th.

Table 1.8. E-government development in the European Union (EU) Member States

Country	*Sub-Region*	*EGDI*	*2014 Rank*	*2012 Rank*	*Change in Rank*
		Very High EGDI			
France	Western Europe	0.8938	4	6	↑ 2
Netherlands	Western Europe	0.8897	5	2	↓ 3
United Kingdom	Northern Europe	0.8695	8	3	↓ 5
Finland	Northern Europe	0.8449	10	9	↓ 1
Spain	Southern Europe	0.8410	12	23	↑ 11
Sweden	Northern Europe	0.8225	14	7	↓ 7
Estonia	Northern Europe	0.8180	15	20	↑ 5
Denmark	Northern Europe	0.8162	16	4	↓ 12
Austria	Western Europe	0.7912	20	21	↑ 1
Germany	Western Europe	0.7864	21	17	↓ 4
Ireland	Northern Europe	0.7810	22	34	↑ 12
Italy	Southern Europe	0.7593	23	32	↑ 9
Luxembourg	Western Europe	0.7591	24	19	↓ 5
Belgium	Western Europe	0.7564	25	24	↓ 1
		High EGDI			
Lithuania	Northern Europe	0.7271	29	29	-
Latvia	Northern Europe	0.7178	31	42	↑ 11
Greece	Southern Europe	0.7118	34	37	↑ 3
Portugal	Southern Europe	0.6900	37	33	↓ 4
Hungary	Eastern Europe	0.6637	39	31	↓ 8
Malta	Southern Europe	0.6518	40	35	↓ 5
Slovenia	Southern Europe	0.6506	41	25	↓ 16
Poland	Eastern Europe	0.6482	42	47	↑ 5
Croatia	Southern Europe	0.6282	47	30	↓ 17
Slovakia	Eastern Europe	0.6148	51	53	↑ 2
Czech Republic	Eastern Europe	0.6070	53	46	↓ 7
Cyprus	Western Asia	0.5958	58	45	↓ 13
Romania	Eastern Europe	0.5632	64	62	↓ 2
Bulgaria	Eastern Europe	0.5421	73	60	↓ 13
EU Average		**0.7300**			
Regional Average		**0.6936**			
World Average		**0.4712**			

Ireland launched its Public Service Reform Plan in 2011. The Plan highlights the role of ICT as a key enabler in delivering better public services and with a strong e-government element. Its eGovernment 2012–2015 policy document sets out a vision that places the user at the centre of eGovernment policy and introduces a new approach to transform how citizens and businesses engage with the state and reduces the costs of public service delivery.[21] As with many other countries in the region that have improved their ranking significantly, Montenegro has also directed its efforts to e-government. At the end of 2011, the country launched its Strategy for the Development of the Information Society 2012–2016 and has inaugurated several e-government initiatives, including a business licensing e-registry portal.

Box 1.6. Italy: Compass of Transparency

The demand for transparency in public administration has been growing exponentially in Italy. Under new laws introduced since 2009, the website of every public administration is now the main vehicle of transparency. To date there are 42 typologies of different information and data that should be present by law on public administration websites (e.g. balance sheets, consultants, data about executives, performance plans, complete information about the organizational structure and the services provided to citizens). The 'Compass of Transparency' (*La Bussola della Trasparenza*), launched in 2012, is an online portal that gives the citizens the possibility to automatically analyze and monitor, in real time, the implementation of all the data and information requirements imposed by Italian law on the websites of public administrations. The core of the system is an engine that, through many software sensors and mathematic algorithms, automatically analyzes the websites in real-time or periodically. The engine verifies the presence of the contents that must be legally published on the homepage and on the internal pages of more than 10,000 administration websites.

Source: Government of Italy, Ministry of Public Administration and Simplification, http://www.magellanopa.it/bussola/page/overview.html

A typical feature of European e-government strategies is to provide distinct portals on government information and on online services for citizens. Increasingly, countries in the region are also providing portals on open government data and e-participation as well as for businesses. This increases the number of 'core' e-government websites per country to a handful, moving beyond the idea of single 'one-stop-shop' portals. This approach helps to provide more targeted, while connected and user-friendly portals to different users, with the amount of information and services made available by governments increasing continuously.

Europe should continue its efforts to make online services ever more user-centric, while ensuring that those who cannot use online services are not excluded and also fully embrace the opportunities of e-participation. The experience of some of the top performing countries in the region, as well as the countries that have improved their ranking significantly, shows that long-term and holistic strategic planning in e-government brings about tangible results. The lesson that can be learnt from the region as a whole is that embedding e-government in wider socio-economic development frameworks is crucial to successful e-government.

1.3.5. Oceania

Australia and New Zealand still lead the region with high EGDI scores of 0.9103 and 0.8644 respectively. Australia and New Zealand also are more economically advanced as developed countries; whereas the rest of the islands in the region have smaller economies, populations and land mass; and thus have fewer resources. The majority of the other countries in the region, with the exception of Fiji and Tonga, are in the range of 108th (Palau) to 188th (Papua New Guinea) in global ranking. Australia and New Zealand also scored very high on the TII and HCI, both approaching the maximum normalized score of 1 (see Table 1.9).

Table 1.9. Countries in Oceania sorted by EGDI ranking

Country	*Level of Income*	*EGDI*	*2014 Rank*	*2012 Rank*	*Change in Rank*
		Very High EGDI			
Australia	High	0.9103	2	12	↑ 10
New Zealand	High	0.8644	9	13	↑ 4
		High EGDI			
Fiji	Upper Middle	0.5044	85	105	↑ 20
		Middle EGDI			
Tonga	Upper Middle	0.4706	98	111	↑ 13
Palau	Upper Middle	0.4415	108	113	↑ 5
Samoa	Upper Middle	0.4204	111	114	↑ 3
Micronesia (Federated States of)	Upper Middle	0.3337	130	127	↓ 3
Kiribati	Upper Middle	0.3201	132	149	↑ 17
Tuvalu	Upper Middle	0.3059	137	134	↓ 3
Marshall Islands	Upper Middle	0.2851	142	146	↑ 4
Nauru	Upper Middle	0.2776	145	141	↓ 4
Vanuatu	Lower Middle	0.2571	159	135	↓ 24
		Low EGDI			
Solomon Islands	Lower Middle	0.2087	170	168	↓ 2
Papua New Guinea	Lower Middle	0.1203	188	177	↓ 11
Regional Average		**0.4086**			
World Average		**0.4712**			

The Australian e-government portal offers an extensive A to Z list of e-services and forms, both at the federal and local levels, as well as connections to national, local and regional government websites. The portal also offers a section for starting a career or looking for a job online; as well as information on starting a business in Australia.

The portal of New Zealand is a one-stop-shop offering the same connected services as Australia, as well as an up to date e-participation section where citizens can send inquiries, issues of concern, or a submission on a bill to the government. Additionally, the portal offers citizens an e-consultation page on issues such as transport planning and development, workplace safety, educational matters, the environment, health and business.

1.4. Country groups

Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Land Locked Developing Countries (LLDCs) face many common economic, social and environmental challenges, including special vulnerability to economic crisis and natural disasters. E-government can help to address many of these challenges, including providing greater access to public services, especially for the most disadvantaged and vulnerable groups, by enhancing disaster risk reduction

and enabling greater government efficiency and transparency to ensure more effective use of limited resources.

In general, the countries in these groups are among the lowest in the global e-government ranking, with each group's average falling far below the global EGDI average of 0.4712. Out of the total of 92 countries in the three groups, 16 countries are both Least Developed and Land-Locked Developing Countries, and 9 are both Least Developed and Small Island Developing States. Mostly, SIDS rank highest within the three groups, with the average EGDI score of SIDS being 0.4069 compared to 0.3368 for LLDCs and just 0.2139 for LDCs.

The countries of these three groups stand to benefit from the good practices and lessons learnt from other more established e-government practices, with the possibility to avoid possible costly pitfalls and to leap frog in e-government development. In order to ensure the full benefits of e-government in these three groups of countries it is essential to work towards enhanced literacy skills, a comprehensive government online presence and—most importantly—improved access, especially to broadband, through both national efforts and international cooperation.

1.4.1. Small Island Developing States (SIDS)

There are 38 Small Island Developing States (SIDS) among United Nations Member States,[22] in Asia, the Caribbean and Oceania. The SIDS face several unique economic, social and environmental challenges due to their small size and economy, isolation and high cost of providing goods, services and infrastructure—including telecommunications—associated with small populations and geographic dispersion. Small island states are typically comprised of several islands scattered over a wide geographic area (for example the Federal States of Micronesia are comprised of 607 islands and the Seychelles of 115 islands) which poses unique challenges for governments in coordinating and delivering services. In addition, SIDS are especially vulnerable to economic crisis because of their narrow resource and export base and dependence on unreliable sectors such as tourism. They are also more exposed to the effects of climate change, such as sea-level rise and natural disasters.[23] The challenges faced by SIDS have intensified with the natural disasters associated with climate change and the lasting negative impacts of the global financial crisis. This highlights the structural nature of the constraints of the SIDS and the lack of effective national and international response mechanisms. Several of these difficulties are amplified by the SIDS limited access to modern technologies.

As a group, the SIDS rank low in the global EGDI. Only 13 out of the 38 SIDS rank in the global top 100. The biggest improvers in this group are Fiji (from 105th to 85th), Kiribati (from 149th to 132nd), Bahrain (from 36th to 18th) and Mauritius (from 93rd to 76th). None of the ten Least Developed Countries among the SIDS rank in the top 10 of this group (see Table 1.10).

E-government holds the potential to address several of the issues faced by SIDS, for example in relation to Disaster Risk Reduction (DRR) and improved data availability. E-government—taking advantage of mobile technology, Internet, social media and space-based technologies such as Geographic Information Systems (GIS)—can be used effectively especially in the preparedness and

response phases[24] of DRR.[25] The use of e-government and ICT-tools for DRR can be divided into two broad categories. The first category (phase), deals with forecasting, mapping and minimization of risks during a disaster, by raising awareness and giving access to information beforehand. The second category (phase), tackles risk and disaster management, during and after the emergency, by coordinating the response and rescue operations[26] as was the case in Haiti after the 2010 earthquake (see Box 1.7). Through the use of satellite communications, e-government can play an important role for those who are not reached by more traditional disaster preparedness programmes, such as older persons, people living in poverty and rural populations, which is especially important in SIDS where populations are widely dispersed.

Table 1.10. Top 10 Small Island Developing States

Country	*Sub-Region*	*2014 EGDI*	*2014 Rank*	*2012 Rank*	*Change in Rank*
		Very High EGDI			
Singapore	South-Eastern Asia	0.9076	3	10	↑ 7
Bahrain	Western Asia	0.8089	18	36	↑ 18
		High EGDI			
Barbados	Caribbean	0.5933	59	44	↓ 15
Antigua and Barbuda	Caribbean	0.5927	60	49	↓ 11
Mauritius	Eastern Africa	0.5338	76	93	↑ 17
Grenada	Caribbean	0.5220	78	75	↓ 3
Seychelles	Eastern Africa	0.5113	81	84	↑ 3
Fiji	Oceania	0.5044	85	105	↑ 20
		Middle EGDI			
Saint Kitts and Nevis	Caribbean	0.4980	90	81	↓ 9
Trinidad and Tobago	Caribbean	0.4932	91	67	↓ 24
SIDS Average		0.4069			
World Average		0.4712			

Furthermore, mobile phones have proven to be effective for early warning systems in SIDS due to portability, high penetration and relatively low-cost. Mobile apps can provide critical information on natural disasters quickly to first responders, disaster victims and the population at large through text messages and allow citizens to submit reports of natural hazards online.[27] In addition to mobile phones, it is important to employ other means such as libraries and kiosks with internet connections to reach remote islands and rural populations.

E-government is of special importance in SIDS also in relation to citizen engagement and improving the livelihood of people. With e-participation, citizens in even the most remote and far-scattered islands can be connected to their government and be consulted in decision-making processes. In commerce and improving the livelihood of people, ICT enabled tools such as mobile apps for fishers play an important role in reducing poverty (see Box 1.8). Governments should ensure that authorities and agencies at all levels have adequate knowledge and skills to support small-scale fisheries and other trades in order to guarantee successful co-management arrangements.

Box 1.7. Haiti: Response and recovery with Sahana free and open disaster management system

The Sahana Disaster Management System, which provides modular, web-based disaster management applications, was developed by the open source community in the aftermath of the 2004 tsunami in Sri Lanka. Since then, Sahana has been deployed in several natural disasters around the world, including the Haiti earthquake in 2010. The Sahana volunteer community responded immediately to the earthquake and set up the Sahana Haiti 2010 Earthquake Disaster Response Portal to provide and share information needed for the relief operation. These included an organization registry to track the agencies' relief efforts and to avoid duplication; a request management system where requests such as 'bring water' were made visible to the relief organizations and contained ticketing and tracking systems; an SMS service through which citizens could request assistance and information developed in partnership with the US State Department; a hospital management system; a food request portal developed in response to a request from the World Food Programme; a disaster victim identification registry; a shelter registry; a translation service; and situation mapping as well as missing persons and victim identification registries developed in partnership with Google and Yahoo. The quick response and collaboration between the Sahana volunteer community, governments, international organizations, civil society and the private sector, is a good practice of different actors coming together swiftly to help those in urgent need, and where the national government structures and capacities to respond to the disaster, were badly damaged.[28]

Source: http://wiki.sahana-foundation.org/_media/iscram_2010_sahana_haiti.pdf

Box 1.8. Trinidad and Tobago: m-fisheries

The fishery sector is vital to the economy of SIDS such as Trinidad and Tobago, both in providing employment, particularly in rural communities and in enhancing the local food supply. The government of Trinidad and Tobago has prioritized development of the fishing industry due to its economic and social importance for the country with the target of making it not only competitive, profitable and sustainable but also equitable, inclusive and supportive of the local fishing communities. Barriers to fishing industry development include lack of training in natural resources management and in sea safety. Due to high mobile phone penetration in the country (86 per cent among the poor), the use of mobiles is identified as a highly effective tool to address the problems especially in the small scale fishing industry. Through the mFISHERIES mobile app users can see 'Got Fish' posts by local fishermen, make a request via the 'Need Fish', get quick access to wholesale market prices, access a compass and GPS enabled location, improve their safety through the 'Info Zone' with sea safety information and a SOS button for emergencies that automatically alerts the coast guard about one's position when help is needed.

Source: mFISHERIES http://cirp.org.tt/mfisheries/

Due to the coastal zone concentration in a limited land area in some of the most vulnerable regions of the world, the effects of climate change and sea-level rising, put the economic, social and environmental development efforts of SIDS at risk. The long-term effects of climate change can even threaten the existence of some SIDS.[29] A comprehensive approach is needed to address the challenges, and e-government can play a key role. A holistic e-government strategy with strong DRR, e-participation and e-service components, such as e-health, e-education and e-commerce can enable the governments in SIDS to work and deliver as one and to advance sustainable development in all its dimensions.

1.4.2. Landlocked Developing Countries (LLDCs)

A landlocked country is one that is entirely enclosed by land, or whose only coastline lies on a closed sea. There are 48 landlocked countries among the United Nations Member States, 31 of which are Landlocked Developing Countries (LLDCs).[30] They are widely dispersed around the globe: 15 are located in Africa, 12 in Asia, 2 in Europe and 2 in South America. The LLDCs are among the most disadvantaged developing countries, and 16 out of the 31 LLDCs are also Least Developed Countries. The economic performance of LLDCs reflects the disadvantages of their geography with lack of access to major shipping routes, fisheries and other marine resources. The LLDCs are generally the poorest countries in their region, with the weakest growth rates and are the most dependent on export earnings.

Generally, the LLDCS are positioned low in the global ranking with only seven LLDCs in the global top 100. The Asian countries dominate the list of top performers within the group, with Kazakhstan taking the top position and Armenia, Mongolia and Azerbaijan all being in the LLDC top five (see Table 1.11). None of the 16 Least Developed Countries among the LLDCs are in the group top ten, with Rwanda ranking 12th in the group and all the others ranking in the bottom 15 of the group. The biggest improvers among the LLDCs are Armenia (from 94th to 61st), Azerbaijan (from 96th to 68th), Ethiopia (from 172th to 157th) and Rwanda (from 140th to 125th). LLDCs have on average considerably lower e-government development rankings than Small Island Developing States, with EGDI averages of 0.3368 and 0.4069 respectively for these two groups, but higher than the Least Developed Countries which average at 0.2164.

Limited access to world markets is one of the most pressing constraints faced by LLDCs with high transport costs and dependence on passage through sovereign transit countries hampering their competitiveness. LLDCs also often rely on their neighbours' telecommunication networks as accessing the international submarine fibre networks would incur high administrative and infrastructure costs. Telecommunication networks are especially underdeveloped in rural areas, creating an additional barrier to the promotion of inclusive ICT strategies. Thus, it is not surprising that the Telecommunication Infrastructure Index is the weakest out of the three components of the E-Government Development Index for the majority of LLDCs. There are however some encouraging examples, such as Bolivia which has been successful in detouring its neighbours' transit networks by building a fibre optic network across the country. Today Bolivia is able to take advantage of its central geographic location in South America and will be one of the co-owners of the fibre optic infrastructure mega project of the Union of South American Nations (UNASUR).

Table 1.11. Top 10 Landlocked Developing Countries

Country	*Sub-Region*	*2014 EGDI*	*2014 Rank*	*2012 Rank*	*Change in Rank*
		High EGDI			
Kazakhstan	Central Asia	0.7283	28	38	↑ 10
Armenia	Western Asia	0.5897	61	94	↑ 33
Mongolia	Eastern Asia	0.5581	65	76	↑ 11
Republic of Moldova	Eastern Europe	0.5571	66	69	↑ 3
Azerbaijan	Western Asia	0.5472	68	96	↑ 28
		Middle EGDI			
FYR Macedonia	Southern Europe	0.4720	96	70	↓ 26
Uzbekistan	Central Asia	0.4695	100	91	↓ 9
Kyrgyzstan	Central Asia	0.4657	101	99	↓ 2
Bolivia	South America	0.4562	103	106	↑ 3
Botswana	Southern Africa	0.4198	112	121	↑ 9
LLDCS Average		**0.3368**			
World Average		**0.4712**			

Box 1.9. Nepal: On the Road to the Knowledge Based Society

Nepal is a mountainous LLDC which suffered from a long civil war that destroyed the country's telecommunication infrastructure. The country's ranking has plummeted since the first *Survey* from 130th in 2003 to 165th in 2014. The government of Nepal has been working towards a holistic e-government transformation to provide better services to citizens, improve transparency and to work towards the knowledge based society. Eight projects were selected as priority for the e-government transformation: government portal, national ID, e-Education, infrastructure, enterprise architecture, Public Key Infrastructure, Integrated Data and Training Center and groupware. The country's 2006 IT Policy provides a broad framework for e-government transformation with the aim to transform Nepal into a knowledge society that can fully harness the benefits of e-governance to promote good governance and advance socio-economic development and reduce poverty by 2015. The policy is divided into regulatory framework, infrastructure, e-government content and applications, private sector participation, human resource development and organization.

Source: United Nations University, International Institute for Software Technology, Center for Electronic Governance, 2011, e-Government Strategy Draft for Afghanistan, www.egov.iist.unu.edu

Regional infrastructure strategies for integration and administrative coordination are needed to expand LLDCs access to ICT infrastructure. Support is also required to develop large scale public-private, public-public and South-South partnerships to implement strategies for ICT development and to enhance cooperation. Even though infrastructure is the biggest bottleneck for e-government development in LLDCs, governments should not lose sight of the importance of investing in people through education and ICT-literacy programmes, as well as enhancing their online presence by providing improved online services.

In LLDCs, e-government plays an instrumental role in facilitating progress in sectors such as trade and entrepreneurship through e-services, for example simplifying business licensing applications and enhancing services in education and health, as well as promoting socially inclusive growth for all.

1.4.3. Least Developed Countries (LDCs)

There are 48 Least Developed Countries (LDCs) among United Nations Member States[31] of which 34 are in Africa, 9 in Asia, 4 in Oceania and 1 in the Caribbean. This group of countries comprises more than 880 million people or about 12 per cent of the world population, but accounts for less than 2 per cent of the world GDP and about 1 per cent of global trade in goods.[32] The lack of ICT infrastructure and access to modern technologies are among the major challenges facing the LDCs. However significant progress has been made, especially with regard to mobile technology in the LDCs with almost 42 per cent of people having access to a mobile phone in 2011, up from 33 per cent in 2010. In stark contrast, only six out of 100 had access to the Internet in 2011, whilst 79 per cent did not have access to electricity.[33] Due to the much higher access to mobile phones than computers, m-government services such as information and notifications by SMS, m-banking and m-health services are of special importance in the LDCs.

E-government development remains very low in the LDCs, with the LDC EGDI average being 0.2121 compared to the world average of 0.4712 and with no countries in the top 100 of the global ranking. Rwanda is the highest ranking in this group at 125th, followed by Kiribati at 132nd (see Table 1.12). The biggest improvers among the group are Kiribati, Cambodia and Yemen (see Box 1.10), improving their respective rankings from 149th to 132nd, from 155th to 139th and from 167th to 150th in the global ranking. Another significant improver is Rwanda going from 140th to 125th which is in line with the overall positive development trend in the country.

Table 1.12. Top Least Developed Countries

Country	*Sub-Region*	*SIDS*	*LLDC*	*EGDI*	*2014 Rank*	*2012 Rank*	*Change in Rank*
			Middle EGDI				
Rwanda	Eastern Africa		x	0.3589	125	140	↑ 15
Kiribati	Micronesia	x		0.3201	132	149	↑ 17
Tuvalu	Polynesia	x		0.3059	137	134	↓ 3
Cambodia	South-Eastern Asia			0.2999	139	155	↑ 16
Angola	Middle Africa			0.2970	140	142	↑ 2
Bhutan	Southern Asia		x	0.2829	143	152	↑ 9
Tanzania	Eastern Africa			0.2764	146	139	↓ 7
Bangladesh	Southern Asia			0.2757	148	150	↑ 2
Yemen	Western Asia			0.2720	150	167	↑ 17
LLDCS Average				0.2121			
World Average				0.4712			

Box 1.10. Yemen: Reaping the benefits of long-term planning

In 2002, Yemen launched a 10-year e-government programme with a budget of USD 50 to 60 million which aimed to provide better access to services to disadvantaged groups, increasing access to telephone services and moving to electronic financial transactions. The Internet was introduced in Yemen in 1996 and its usage increased gradually between 2000 and 2010, with a big jump in the number of Internet users from 420,000 in 2010 to 3,691,000 in 2012 representing 14.9 per cent of the total population. Despite big improvement in Yemen's e-services, the awareness and usage among the population is still relatively low. According to a 2013 study, 29.4 per cent of the citizens were not aware of e-government services, 47.6 per cent were aware but not using them and only 22.3 per cent reported using the services. Awareness and usage is also much higher among men than women. Countries such as Yemen that have recently made a significant investment in e-government, also need to focus on providing ICT-literacy training, as well as to raise awareness of the benefits of e-services, including through social media, to ensure high adoption and maximum benefits of e-governments services. As a result of ongoing improvements, Yemen's rank increased from 167 to 150 in the global ranking, between 2012 and 2014.[34]

The challenge for e-government development in this group is the lack of telecommunication infrastructure. The LDC Telecommunication Infrastructure Index average is 0.0929 compared with the world average of 0.3650. This hampers the ability of governments to implement e-government programmes and e-services as well as the adoption of any online services by citizens, even if available.[35] While much remains to be done both in terms of e-government implementation and adoption among the LDCs, it is noteworthy that all the 49 countries have an online presence, whereas in the previous *Survey* two LDCs, Central African Republic and Guinea, had none.

Even though LDCs have improved their basic, or emerging, online presence—in most cases restricted to providing a limited amount of information and links online—they are making little or no progress in moving to the more advanced stages of e-government development, including the provision of e-services, e-participation and open government data. Without significant changes in the LDC's e-government development, the distance of e-government development between the group and the rest of the world will increase further. The LDCs continue to face multiple severe socio-economic challenges and e-government does not top the list of the national development agenda of many of the LDCs. However, with insufficient investment in infrastructure and the lack of long-term e-government planning, these countries will lose out on the crucial benefits of e-government in making public administrations more cost-effective, efficient, citizen-centric, transparent and accountable, which play a key role in poverty elimination and promoting sustainable development. The governments in these countries should consider the benefits of e-government and online service delivery, especially in relation to mobile services and take necessary measures to

establish mid and long-term e-government strategies and to improve their infrastructure. These countries should also have the full support of the international community through partnerships and knowledge sharing.

In conclusion, it is even more critical for the LDCs that face multiple challenges with limited resources, to consider smart investments in ICT infrastructure and e-government services which can bring about substantial returns on investment. This in turn will deliver multiple benefits such as better access to essential services, including to the most disadvantaged and vulnerable groups and create savings by streamlining and simplifying government processes as well as enhancing accountability and transparency.

1.5. Conclusion

Public administration, being the cornerstone of governments' work is essential for improving peoples' lives. As illustrated in this chapter, amidst the economic, social and environmental challenges, e-government has continued to play an important role in enabling the delivery of quality public services that meet citizen needs and goals by transforming how the public sector works.

Considering that the EGDI is a broad relative index, caution should be taken against interpreting positional changes in rankings across similarly ranked countries. 'Higher' rankings do not necessarily mean 'better' or "desirable" outcomes. As such countries must decide the level and extent of their e- government initiatives based on their specific national development context.

Regardless of the complexity and diversity of countries in the world, some general conclusions at the global and regional levels can be made. In addition to effective planning and deployment of e-services, governments may consider enhancing their ICT infrastructure and raise the level of human capital, including improvement of the ICT literacy of citizens, to make use of the new technologies so as to realize the full benefits of online and mobile services. This should go hand in hand with capacity development of leadership in e-government and public servants as facilitators of online public services.

To further increase the scope and extend the use of online services, governments could provide even more citizen-centric and user-friendly services putting the needs of citizens at the core of planning and implementation of online services by engaging them (citizens) in consultative processes. Furthermore, countries may explore avenues to strengthen regional and global cooperation mechanisms with a view to facilitate national development goals, thus encouraging coherence and coordination among countries.

Nevertheless, in all regions there are outstanding stories which show countries overcoming obstacles and resource constraints to achieve improvements in leveraging e-government to achieve national development objectives.

Progress in online service delivery

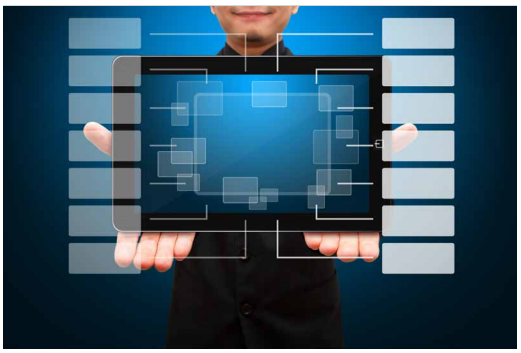
2.1. Introduction

Continuing the presentation and analysis of the world e-government rankings, this chapter reports on global progress in online service delivery as evidenced by the 2014 *United Nations E-Government Survey* data and considers factors that may be helping or hindering the roll-out of e-services at the national level. The analysis attempts to shed light on the meaning behind the numbers by highlighting successful strategies and discussing some common challenges and barriers to achieving an efficient and effective public administration as a condition of good governance.

2.1.1. How online services are measured

The online services component of the E-Government Development Index (EGDI) is a composite indicator measuring the use of ICT by governments to deliver public services at national level. It is based on a comprehensive *Survey* of the online presence of all 193 United Nations Member States. The *Survey* assesses the technical features of national websites as well as e-government policies and strategies applied in general and by specific sectors for delivery of services.

The results are tabulated and presented as a set of standardized index values on a scale from zero to one, one corresponding to the highest rated online services and zero to the lowest. As with the EGDI itself described in chapter 1, the index values are not intended as absolute measurements. Rather, they capture the online performance of countries relative to one another at a particular point in time. Because the index is a comparative tool, a high score is an indication of best current practice rather than perfection. Similarly a very low score, or a score that has not changed since the last edition in 2012, does not mean there has been no progress in e-government development. The distance between scores conveys the gap in online service delivery.



In this chapter:

Chapter 2

As outlined in Chapter 1, the *Survey* instrument assumes a general four-stage model of online service development where stage 1 corresponds to emerging information services, stage 2 to enhanced information services, stage 3 to transactional services and stage 4 to connected services. Each stage demands a higher level of sophistication and, often, increased commitment of resources. In assessing progress, a rough balance of basic and advanced website features is sought as well as evidence of the institutional and strategic foundations of a national e-government programme. A detailed description of the methodology, as well as a country-by-country assessment for each stage of online service development, is provided in the accompanying statistical annex.

2.1.2. What's new in 2014?

While the basic model has remained consistent since the *Survey* was first introduced, the precise components of the OSI have evolved as our understanding of e-government changes and the underlying technology evolves. In 2014, data was collected on the provision of basic e-services, attention to e-participation, multichannel service delivery, expanding usage, adoption of open data initiatives, whole-of-government and bridging digital divides that may exist within and between countries.

Of particular note in this *Survey* round was an increased emphasis on e-participation features and evidence of open data initiatives on national websites given evolving expectations about transparency and participation in public affairs. The provision of environmental e-information was also added to the basket of basic online services assessed—alongside education, health, finance, labour and social welfare functions—given current attention to questions of environmental stewardship in the global picture of the future we want. As technology evolves and countries make progress, goals are also set higher and the *Survey* is adjusted accordingly.

2.2. Global analysis

2.2.1. Overall results

France ranks first in online service delivery in 2014, followed closely by Singapore and the Republic of Korea. These countries stand out, among other things, for their integration of e-services, expanded roll-out of mobile applications and provision of opportunities for e-participation. Spain (tied at 4th), Uruguay (14th), New Zealand (15th) and Chile (16th) have all made their way into the top twenty of 2014, pushing ahead of former 2012 leaders Denmark, Norway, Sweden and Malaysia.

As in 2012, the 2014 results show the reappearance of Bahrain (7th), the United Arab Emirates (12th) and Saudi Arabia (tied at 18th) among the frontrunners. All members of the Gulf Cooperation Council, these countries have managed to remain in step with counterparts in other regions, typically OECD member countries, through high-level attention to e-government development and the benefits of the wider Information Society. A full list of the top twenty countries in online service delivery together with Online Service Index values is given in Table 2.1.

Table 2.1. Top 20 countries in online service delivery

Country	*Online Service Index*
France	1.0000
Singapore	0.9921
Republic of Korea	0.9764
Japan	0.9449
Spain	0.9449
United States	0.9449
Bahrain	0.9370
Australia	0.9291
Netherlands	0.9291
Canada	0.9134
United Kingdom	0.8976
United Arab Emirates	0.8819
Israel	0.8740
Uruguay	0.8504
New Zealand	0.8425
Chile	0.8189
Colombia	0.7874
Estonia	0.7717
Finland	0.7717
Saudi Arabia	0.7717

Box 2.1. France public service—commitment to continuous improvement

Taking the top place in the 2014 Online Service Index, France scores well across all practice areas and stages of online service development due to ongoing action to improve the quality of public services, integrate governmental websites and encourage consultation with citizens on both public policy and service delivery methods. The official website of the national administration (service-public.fr) directs individuals, businesses and associations to relevant services by event as well as by subject, invites ideas about administrative simplification, connects citizens with current debates and consultations and facilitates interaction with government through single sign-on.

A leader in the field, France has also committed to further expanding online public service delivery while containing costs by reviewing free alternatives to commercial ICT infrastructure and applications in a systematic fashion and expanding the use of open source software. The new policy, introduced in 2012, aims to lower ICT expenditures and improve agility while encouraging innovation and engagement of other actors, such as local authorities and developer communities, in e-service co-production.[1]

Source: http://circulaire.legifrance.gouv.fr/pdf/2012/09/cir_35837.pdf. Accessed 29 October 2013.

Continuing the trend towards greater levels of online connectivity since 2003, all 193 Member States now have websites as shown in Figure 2.1. This includes the Central African Republic, Guinea and Libya, which had no national website in 2012 and is a reflection both of evolving expectations on the part of increasingly connected citizens and the enhanced capacity of governments to utilize ICT in addressing public service needs.

Figure 2.1. Percentage of United Nations Member States with no online presence, 2003–2014

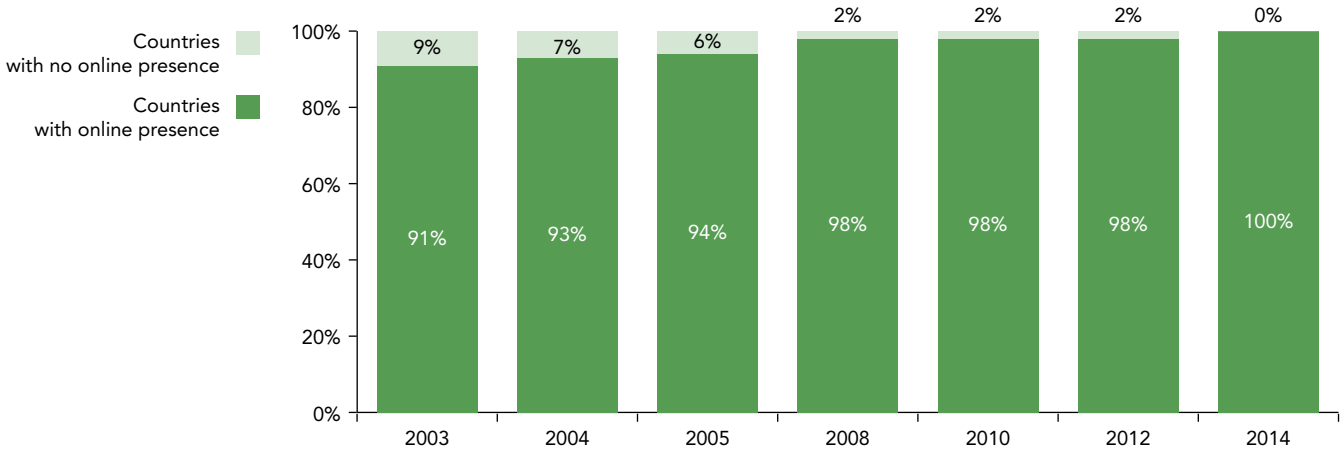
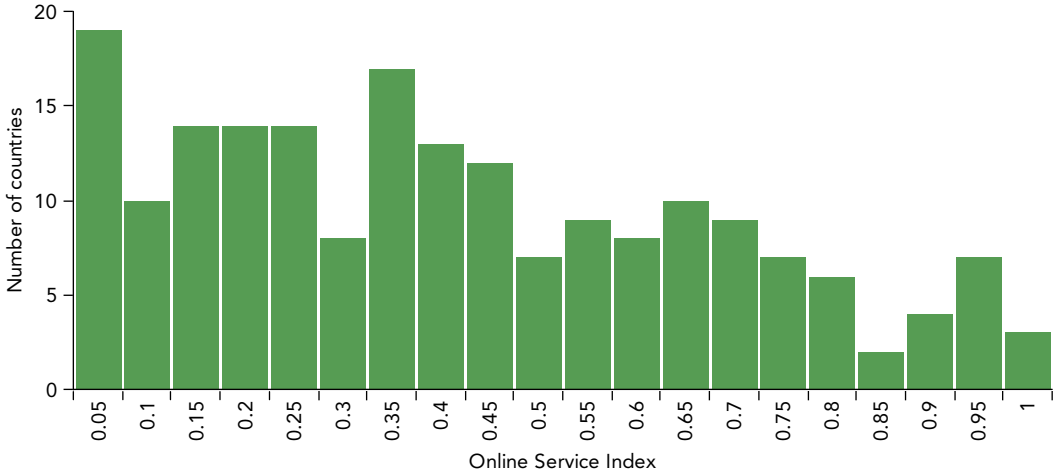


Figure 2.2 shows a large number of countries at lower levels of online service development, highlighting the relative difficulty in supplying transactional and connected services—as described by the *Survey*'s four-stage model. The world mean Online Service Index value is 0.3919, far below what might be considered indicative of global convergence with the leading countries in this field.

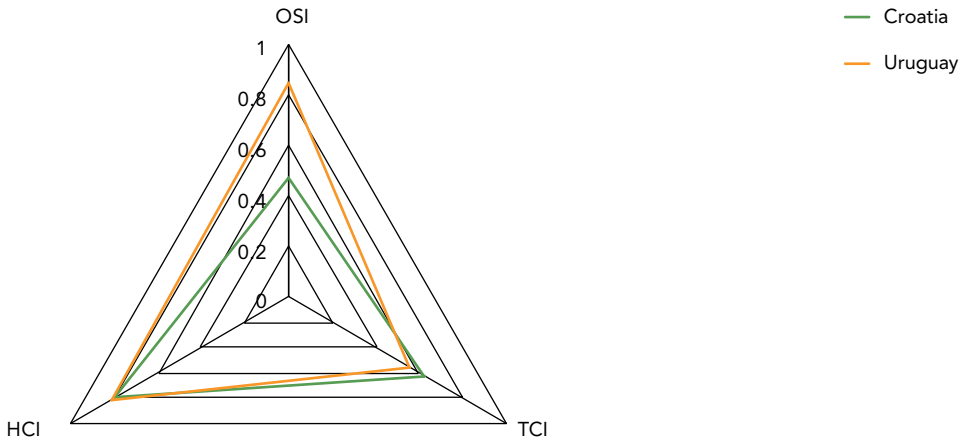
Figure 2.2. Distribution of Online Service Index values



Similarly, the small proportion of high scores in the Online Service Index, for example in the range of 0.7 and above, suggests that some governments with access to more advanced telecommunication infrastructures may be able to

leverage existing technology more fully in public service delivery, especially in cases where human capital is high. To illustrate, consider on the one hand the case of Croatia that is well advanced in human capital and telecommunication infrastructure, but has an Online Service Index that is less than 0.5. On the other hand, consider Uruguay which has the same size and similar income levels to those of Croatia, as well as similar HCI and TII, but has invested more in online services, which is reflected in its OSI (0.8504) as shown in Figure 2.3. This shows that Croatia has great potential to improve its online services.

Figure 2.3. Croatia and Uruguay in comparison



Progress can be attributed to differences in national conditions and policies. While the *Survey*, in general terms, embodies a model of progressive development, in fact ICT take-up in government does not necessarily follow a straight path. Countries may invest in any or all stages of e-government development to varying degrees. For example, the Netherlands (tied at 8th place in online services), scores 100 per cent in stage 1, 75 per cent in stage 2, 70 per cent in stage 3, then rises again to 88 per cent in stage 4 with an overall score of 82 per cent. Japan on the other hand (tied at 4th place in online services) scores 97 per cent in stage 1, 73 per cent in stage 2, rises to 79 per cent in stage 3 and then to 88 per cent in stage 4 with an overall score of 83 per cent (see Table 2.2).

Only a few countries have developed a high number of transactional services online. Whereas globally the mean scores in stages 1, 2 and 4 are 64 per cent, 40 per cent and 27 per cent respectively, in stage 3 the mean score is 22 per cent (see Annexes—Table 10. Online Service Index and its components). This gap may be due to the inherent challenges of ensuring robust online security, identity management, payment systems and channel coordination. Citizens may also simply prefer face-to-face or assisted interaction when applying for benefits, permits or otherwise engaging with institutions on personal matters. Such constraints and preferences would normally be considered in service design by line ministries resulting in a greater emphasis on the information-sharing, inquiry and consultation features more indicative of stages 1, 2 and 4 (see Figure A.4 in Survey Methodology). A country that has made an exemplary commitment to provision of transactional services is New Zealand (see Box 2.2).

Table 2.2. Extent of e-service delivery stages in selected countries

Country	*Stage 1 Emerging presence*	*Stage 2 Enhanced presence*	*Stage 3 Transactional presence*	*Stage 4 Networked presence*	*Total*
		67%–100%			
Japan	97	73	79	88	83
Netherlands	100	75	70	88	82
New Zealand	97	66	84	53	75
Estonia	100	66	56	59	69
Saudi Arabia	94	68	63	53	69
		34%–66%			
Russian Federation	91	77	51	35	63
Costa Rica	94	55	37	44	56
Jordan	91	41	21	50	48
South Africa	75	43	12	24	37
Indonesia	69	34	9	35	35
		0%–33%			
Senegal	78	32	5	15	30
Kyrgyzstan	81	27	2	9	27
Saint Lucia	44	32	14	12	25
Zambia	47	16	0	9	16
Vanuatu	34	5	5	6	11

Box 2.2. New Zealand—online transactional services at the forefront of government transformation

New Zealand's public service has committed to offering easy access to government services in an online environment. The Government aims to have all new services offered online by 2017. At the same time, it continues to recognize the importance of face-to-face interaction for those without Internet access.

Measures to protect personal information such as the establishment of system architectures that incorporate security and privacy principles, security and privacy awareness-raising with clear accountabilities through to executive levels and regular audit of government information systems are central components to the Government ICT Strategy and Action Plan to 2017 and recognized as paramount in building public trust in public services. Collaboration among departments, supported by strong leadership in the form of a Government Chief Information Officer, is seen as crucial to moving transactional services online and has been a central plank in the national plan to transform public sector ICT.

Source: http://ict.govt.nz/assets/Uploads/Government-ICT-Strategy-and-Action-Plan-to-2017.pdf

Turning to availability of basic usability features as summarized in Table 2.3, a large majority of countries—87 per cent or 168 out of 193 countries—provide users with a search tool to locate content while only 77 per cent of national governments (148 countries) had updated their home page in the past three

months. Ease of use was further supported by access to content in more than one language in 74 per cent of cases (142 countries), availability of a site map or index 68 per cent of the time (131 countries) and the online publication of a help or frequently asked questions document in 46 per cent of cases (89 countries).

The *Survey* shows continued effort of most countries in building and maintaining site-specific tools, notwithstanding the ubiquity and convenience of commercial search engines. There is also a growing recognition of the importance of providing content in different languages. In 2012, just over half of all countries had multilingual sites whereas according to the 2014 assessment almost three quarters had expanded language options in some form.

Enhanced (Stage 2) features are less common as Table 2.4 suggests. Roughly half of the United Nations Member States maintain an advanced search engine or publish a statement setting out a privacy policy in connection with the use of the government website. User opinion features such as tag clouds and 'hot topics' lists could be found on only 41 per cent of websites. Less than one third of national portals surveyed showed availability of a secure connection.

Table 2.3. Availability of selected basic features

	Number of countries	*Per centage of countries*
Find website using search tools	168	87%
Site updated within past three months	148	77%
Access in more than one language	142	74%
Availability of map/index	131	68%
Help/FAQ feature	89	46%

Table 2.4. Availability of selected enhanced features

	Number of countries	*Per centage of countries*
Advanced search option	101	52%
Privacy statement	97	50%
Tag cloud or 'hot topics'	80	41%
Secure website	53	27%

Figure 2.4 provides a breakdown of typical transactional services and the number of countries for which these services could be readily identified through the national website. Of the transactional services included in the *Survey* instrument, the most commonly found were setting up of personal online accounts (101 countries), income tax filing (73 countries) and business registration (60 countries). An open-ended 'other' category also scored well (76 countries) reflecting a diversity of priorities in building and expanding online services at national level.

Figure 2.4. Transactional services online

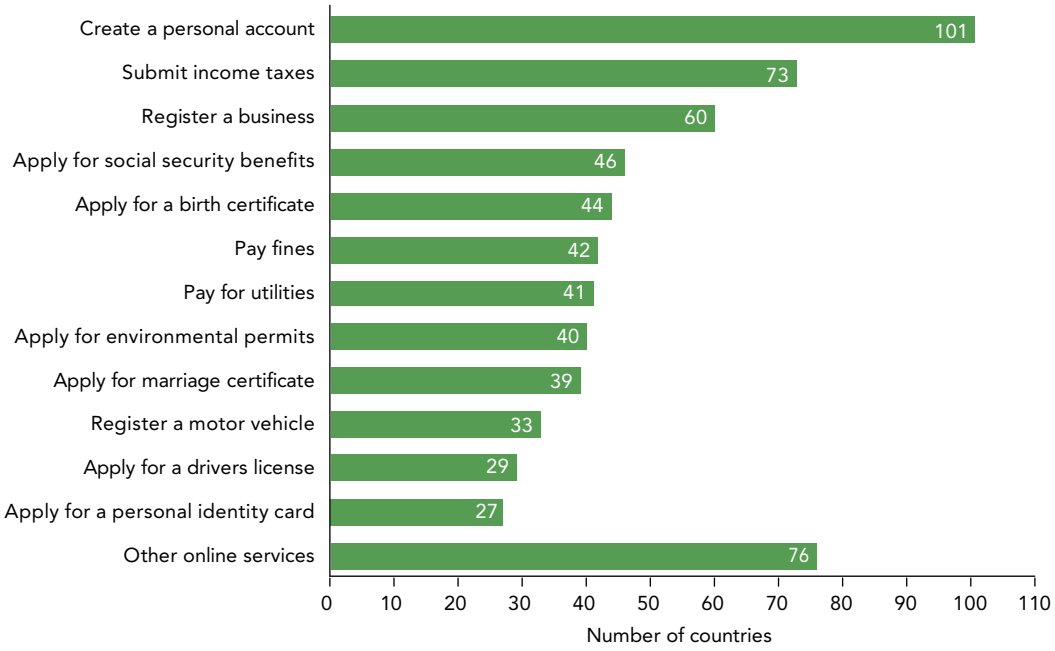
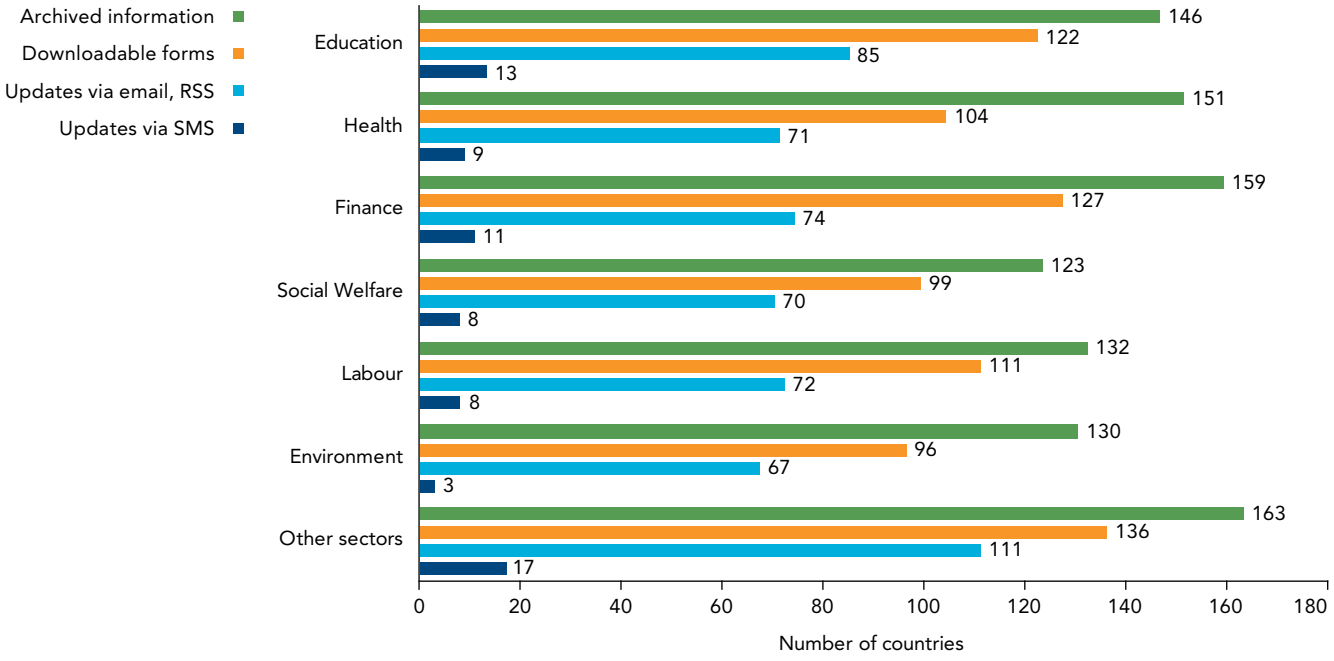


Figure 2.5. Types of services online, by sector



Insufficient Internet security may pose a barrier to the establishment of transactional services (Stage 3) in some countries. This shortcoming, coupled in some instances with limited financial services, may be behind the fact that a majority of governments still do not offer services such as accepting utility payments or applying for permits online.

When considering e-government development in different government sectors, there is additional evidence of the validity of the general four-stage model of progress as shown in Figure 2.5. In all sectors reviewed—education, health, finance, social welfare, labour and environment—as well as in an open-ended 'other' category, archived information was more readily evident than downloadable forms, which were more often seen than email or Really Simple Syndication (RSS) update features. As in 2012, there appears to be substantial underutilized potential of text-based Short Message Service (SMS) across a range of government functions.

2.3. Leading countries by income group

Given the overall results, the question arises as to what factors might account for differences in levels of online service delivery. Comparing the Online Service Index values to an array of other factors reveals that Gross National Income (GNI) and general investment in telecommunication infrastructure are key drivers of progress in e-services.[2] This is a similar result as for the EGDI as a whole described in Chapter 1 and is a reflection both of resources available to pursue e-government programmes and the effect of demand for ICT-enabled services from increasingly connected people and business.

Table 2.5 highlights the top countries in online service delivery, by income group. The leading countries in the high-income category were France (ranked 1st globally), Singapore (2nd) and the Republic of Korea (3rd). Indeed, 19 of the top 20 countries in online service delivery can be counted among the world's wealthiest economies. Within the middle-income group, Colombia comes out ahead in online service delivery (17th globally), followed by Kazakhstan (23rd) and Morocco (30th). Rwanda was found to be the leader in the low-income category in 2014 (ranked 63rd globally), followed by Ethiopia (72nd) and Kenya (79th).

The distribution of Online Service Index values in 2014 is also indicative of different patterns of e-government development in different economic situations. The current state of online service delivery among low-income countries tends to be rudimentary with most countries below 0.2, as seen in Figure 2.6a. Online service delivery in upper middle income countries follows more of a mixed pattern, peaking near the 0.4 mark and tapering off strongly after 0.8, as seen in Figure 2.6c. High income countries are clustered at the high end of the scale with a substantial number scoring above 0.9 in the 2014 Online Service Index, as seen in Figure 2.6d.

Low-income countries tend to focus on information services at the emerging and enhanced stages of e-government development while high-income countries are able to add interactive features and features requiring cooperation among ministries, at the transactional and connected stages.

Although income is important so too are other factors. These include high-level political support, e-government leadership within the national administration, ICT infrastructure and education, as well as institutional capacity for online service development, public accountability and citizen engagement. As Table 2.6 illustrates, Rwanda, Colombia, Ethiopia, Kazakhstan and Morocco, among others, appear to be performing well. Initiatives undertaken by these high performers, highlighted in the accompanying boxes, may provide valuable insights for countries at a similar income level.

Table 2.5. Top countries in online service delivery, by income group

Global rank	*Rank within income group*	*Country*	*Online service index*
		High income	
1	1	France	1.0000
2	2	Singapore	0.9921
3	3	Republic of Korea	0.9764
4	4	Japan	0.9449
4	4	Spain	0.9449
4	4	United States	0.9449
7	7	Bahrain	0.9370
8	8	Australia	0.9291
8	8	Netherlands	0.9291
10	10	Canada	0.9134
		Middle income	
17	1	Colombia	0.7874
23	2	Kazakhstan	0.7480
30	3	Morocco	0.6929
31	4	Malaysia	0.6772
35	5	Mexico	0.6614
37	6	Sri Lanka	0.6535
39	7	Tunisia	0.6378
41	8	Peru	0.6299
43	9	Armenia	0.6142
43	9	Costa Rica	0.6142
43	9	Mongolia	0.6142
		Low income	
63	1	Rwanda	0.5118
72	2	Ethiopia	0.4567
79	3	Kenya	0.4252
98	4	Bangladesh	0.3465
107	5	Mozambique	0.3150
110	6	Zimbabwe	0.3071
115	7	Burkina Faso	0.2992
115	7	United Republic of Tanzania	0.2992
123	9	Madagascar	0.2441
135	10	Gambia	0.2047

Figures 2.6 a–d. Distribution of Online Service Index values, by income group

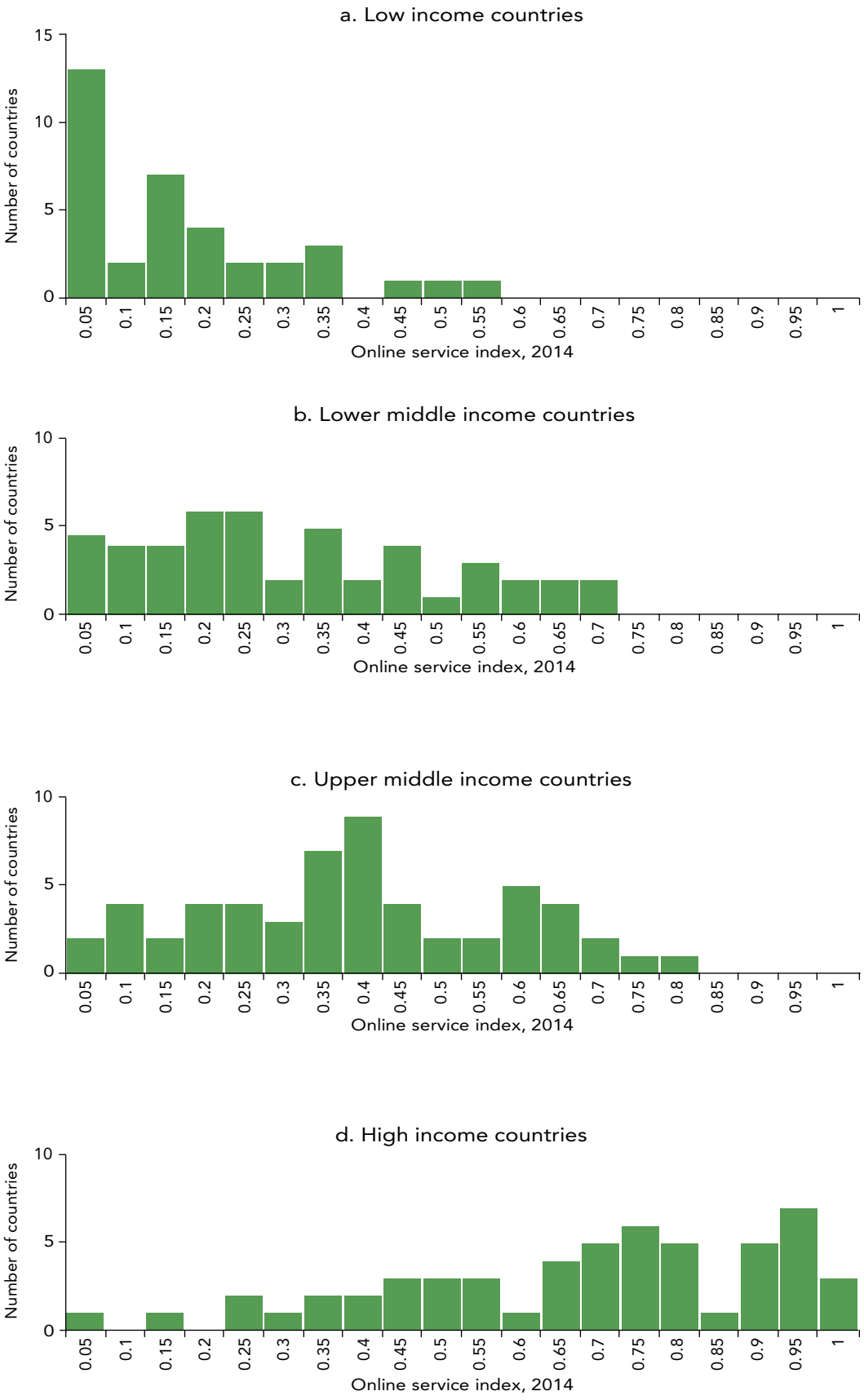


Table 2.6. High online service performance relative to income

Country	*Online Service Index*	*Income group*
Rwanda	0.5118	Low
Colombia	0.7874	Upper Middle
Ethiopia	0.4567	Low
Kazakhstan	0.7480	Upper Middle
Morocco	0.6929	Lower Middle
Kenya	0.4252	Low
Sri Lanka	0.6535	Lower Middle
Malaysia	0.6772	Upper Middle
Tunisia	0.6378	Upper Middle
Mongolia	0.6142	Lower Middle

Table 2.7. Low online service performance relative to income

Country	*Online Service Index*	*Income group*
Equatorial Guinea	0.0315	High
Monaco	0.2205	High
Libya	0.0157	Upper Middle
Saint Kitts and Nevis	0.1339	High
San Marino	0.2756	High
Tuvalu	0.0394	Upper Middle
Barbados	0.2205	High
Algeria	0.0787	Upper Middle
Sao Tome and Principe	0.0079	Lower Middle

Ultimately, the measure of online service utility is its impact on development either directly in provision of services to citizens or indirectly, for example through investment linked to apparent ease of doing business. Low- and middle- income countries with relatively low levels of Internet use such as Ethiopia (1.48 per cent of the population are Internet users), Rwanda (8.02 per cent of the population are Internet users) and Sri Lanka (18.29 per cent of the population are Internet users), and relatively high online service scores may need to invest more in securing telecommunication infrastructure to fully optimize the benefit of e-services.

The converse also applies to high income countries with widespread telecommunication infrastructure and low online service scores such as Monaco (87.00 per cent of the population are Internet users), Saint Kitts and Nevis (79.35 per cent of the population are Internet users) and Barbados (73.33 per cent of the population are Internet users). These are all small countries, and it may be the case that a larger critical mass of Internet users, or potential users, makes it more worthwhile for a country to invest in resource intensive forms of online service delivery such as remote health care, smart energy grids and real-time environmental monitoring. The *Survey* does not, however, require such technological advancement for high scores reflecting the view that even relatively simple information sharing and interaction can produce important benefits when the primary needs and attributes of population segments are reflected in online service design.

Box 2.3. Rwanda—"Our Environment Our Future"

Rwanda has made development of its ICT sector a national priority as a key element of its Vision 2020 and seeks to foster economic growth while combating challenges of environmental degradation attributed to a growing population. The government maintains that ICT applications and services are essential for ensuring sustainable economic development and that good governance includes efficiency in deploying scarce resources and empowering communities through improved access to information and services.

To this end, the country has developed a land administration information system as part of its National ICT Policy and Action Plan 2011–2015. The aim of the project is to substantially reduce cases of competing property ownership claims, the cost of land registration and time taken to produce title deeds. A mining portal has also been implemented and the country is embarking on a number of "Green ICT" initiatives to reduce electronic waste and enable efficient energy generation, consumption and distribution. Public awareness of the importance of environmental protection and sustainable development are promoted through the website of the government's environmental management authority and other media.[3]

Source: http://www.rdb.rw/uploads/tx_sbdownloader/NICI_III.pdf

Box 2.4. Colombia—fishbowl government

Colombia uses its national portal to engage stakeholders in decision-making as part of its "fishbowl government" policy to practice transparency at all levels. The fishbowl approach embodies efforts to enhance access to information, provide services online, encourage citizen participation in policy-making and pursue anti-corruption strategies, all in the name of good government.

An online public consultation site—known as the "urna de cristal"—combined with ongoing coverage of current affairs, use of social media and publication of open data across ministries make the Colombian transparency initiative a standout in the region. The fishbowl policy is an integral part of the National Development Plan 2010–2014, intended to promote prosperity for all through the eight pillars of economic growth, regional development, equal opportunity, innovation, peace consolidation, environmental sustainability, good government and international relevance.

Source: http://www.irc.gov.co/irc/en/fiscalinformation/National%20Development%20Plan%202011-2014.pdf.

Box 2.5. Ethiopia—investing in the future

At 72nd place globally, Ethiopia is one of the best performing LDCs in online service delivery, ahead of many wealthier countries, including a number of European nations. The country's success can be traced in part to high-level recognition of the need to coordinate online services at national level, provide

a strategic direction for e-government development in the country and allocate sufficient resources. The national strategy includes provisions for citizen-centric mechanisms for stakeholder involvement, implementation of 219 online services over a five-year period from 2011–2015, tracking of indicators of achievement and establishment of a national e-government leadership council.

The strategy is linked to the country's national development strategy that envisages a transformation from a primarily agricultural to an ICT-based economy. Despite the country's status as a low-income, landlocked, conflict-affected country, Ethiopia's achievements demonstrate that a vibrant online public administration can emerge from a combination of high-level political commitment, engagement of stakeholders and a specific plan of action linking e-government to national sustainable development priorities.[4]

Source: http://www.mcit.gov.et/documents/1268465/1282796/e-Government+Strategy+Final/ebedc221-0ec2-420d-bd90-dfe362956751?version=1.0documents/12684 65/1282796/e-Government+Strategy+Final/ebedc221-0ec2-420d-bd90-dfe362956751?version=1.0

2.4. Conclusion

On the whole, there is a substantial variability in the scope of online service delivery. Differences between the highest and lowest online service scores and between the four stages of e-service development are considerable, despite progress in a number of areas. A large number of countries fall in the bottom third of the OSI. Improved access to telecommunication infrastructure has facilitated e-government development in some cases, but in general the most advanced countries have continued to outpace the less developed in online service delivery.

Progress in online service delivery is related to income but other factors also play a role. Although each country faces particular conditions and challenges, a strong association with GNI can be discerned in the extent of online service delivery as well as the type of services provided. This finding reaffirms the need for a close connection between online service strategies, telecommunication infrastructure, human capacity and other social and economic factors.

Additional investment in telecommunication infrastructure and human capacity may have the largest proportionate impact and presents the greatest challenge, at low-income levels where the scarcity of both is most pronounced. Given low Internet penetration rates and the continuing high cost of access, national coordinating authorities in low-income countries can play a valuable role in promoting efforts to establish national and regional Internet exchange points, expand community-level access facilities and introduce forward-looking universal service policies tailored to background conditions. Top political commitment to online service delivery as part of a national ICT strategy can be very helpful in this respect, alongside consideration of public-private partnerships and other development financing modalities.

Successful middle-income countries, while continuing to enhance leadership and infrastructure, have also been able to draw on investments in tertiary education and a strengthened ICT sector. Ready access to ICT skills can make a difference in online service performance at the transactional and connected stages in particular, where a range of advanced managerial and technical knowledge is needed to

oversee service integration across functions and levels of government. Partnerships between academic institutions in different countries in the field of e-government, supported by government, civil society organizations and the private sector, are one way that middle-income countries may begin to reduce the skills gap.

Where high-income countries are concerned, the Survey finds an apparent trend towards convergence in online features with increasing commitment to expanding e-participation opportunities and promoting open government data. All countries, including those with lower incomes, can improve online services by ensuring high-level political support and administrative leadership and by strengthening institutional capacity and public accountability. Cooperative arrangements such as international benchmarks appear both to guide progress and hasten activity in priority practice areas such as those covered by the *Survey*.

National capacity for innovation is generally conducive to online service development. Specifically, higher online service scores are associated with increased levels of online creativity in the broader economy as evidenced by WIPO's global innovation index.[5] Countries that have a more vibrant information society are better able to leverage talent and ICT services for improved e-government performance. This positive connection underscores the fact that ICT policy encompassing telecommunication strategy, Internet governance and tertiary education in science, mathematics, engineering and technology can be a key driver of online service expansion in public administration.

E-participation

3.1. Introduction

Governments have a duty to uphold the peoples' right to participate in public governance. At the national level, the right to political and civic participation is often guaranteed in the constitution. The United Nations Public Administration Country Studies, including a *Survey* of the constitutions of all United Nations Member States, found that more than 150 countries enshrine the right of citizens to participate in one form or another.[1]

Governments also stand to benefit from engaging citizens and non-state actors in public policy decision-making and public service delivery. Given the increasingly interconnected systems of agricultural production and distribution, energy use, water and sanitation management, financial transactions, transportation infrastructure and communications networks, to mention a few, governments cannot afford—financially nor technically—to find solutions to complex problems on their own. As issues overlap across national and subnational jurisdictions, geopolitical and social boundaries and public and private institutions, governments are leveraging resources in the private sector and civil society to share responsibilities and accountabilities.

Governments are aided by modern ICTs that are transforming their interface and relations with citizens. ICTs are enabling governments to increase their outreach to citizens and communities for determining their needs and preferences in public policies and services. Conversely, ICTs are empowering citizens to access public institutions and have their voices heard. E-participation, then, is the process of engaging citizens through ICTs in policy and decision-making in order to make public administration participatory, inclusive, collaborative and deliberative for intrinsic and instrumental ends.

E-participation expands a government's toolbox for reaching out to and engaging with its people. It does not replace traditional forms of public participation, whether

In this chapter:

through face-to-face meetings, paper-based communications, telephone calls, physical bulletin boards, among other offline modalities. Rather, governments should consider how best to reach the various social groups among its population by deploying the optimal mix of online and offline modalities within their jurisdictions. This outreach should be differentiated from efforts by people to participate in civic life, often through grassroots movements. Governments ought to recognize and encourage peaceful and constructive social engagement without attempting to take it over. In a similar vein, governments can learn to use social media as a tool to collect and take into account people's views and feedback.

3.1.1. International development agenda and the World Information Society

Recently, the international community has reaffirmed the value of wider public participation through various expressions of consensus on development. For instance, in the *United Nations Millennium Declaration* (2000), paragraph V(25), the General Assembly resolved to "work collectively for more inclusive political processes, allowing genuine participation by all citizens in all our countries," among other measures. At the United Nations Conference on Sustainable Development or Rio +20, Member States declared in General Assembly Resolution 288 of 2012 entitled *The Future We Want*, paragraph 13: "We recognize that opportunities for people to influence their lives and future, participate in decision-making and voice their concerns are fundamental for sustainable development." Participation and citizen engagement are very much seen as a vital part of sustainable development.

At the same time, the international community also considered the potential of the digital revolution for bettering lives and societies at the World Summit on Information Society, held in 2003 and 2005. In the ensuing *Tunis Agenda for the Information Society*, United Nations Member States acknowledged in paragraph 83 that: "Building an inclusive development-oriented Information Society will require unremitting multi-stakeholder effort. …" Moreover, in paragraph 30, they "acknowledge(d) that the Internet, a central element of the infrastructure of the Information Society, has evolved from a research and academic facility into a global facility available to the public."

Thus the purpose and means of e-participation were defined. At the core of the vision of the international community, both for the Future We Want and the World Information Society, lies empowerment of people. The United Nations Commission on Social Development at its 51st Session (2013) concluded, that: "The empowerment and participation of all members of society in social, economic and political life is critical to achieving sustainable development." (paragraph 19, E/CN.5/2013/3). The challenge of e-participation, then, is how best to employ ICTs to create an enabling environment for individuals and groups to be empowered to participate meaningfully and effectively in governance, policy, service development and delivery processes.

3.2. Assessing e-participation: what is included in the 2014 Survey?

Although civic participation is often equated with voting in elections, public participation and citizen engagement extends to shaping public policies and determining public service delivery. Governments' efforts to promote participation can benefit from considering the various models of public participation that have been developed.[2] These models can also serve as the basis of e-participation models.

The *United Nations e-Government Survey* uses a three-level model of e-participation that moves from more "passive" to "active" engagement with people. The model includes: 1) *e-information* that enables participation by providing citizens with public information and access to information upon demand, 2) *e-consultation* by engaging people in deeper contributions to and deliberation on public policies and services and 3) *e-decision-making* by empowering people through co-design of policy options and co-production of service components and delivery modalities. This model of e-participation is based on the assumption that a shift from more "passive" to "active" engagement brings about true people empowerment, a necessary condition for sustainable development.

This model of e-participation also gives tacit acknowledgement to two trends. First, there is a shift in view of people from passive receivers of services to co-creators of public value and contributors to community resilience. Second, the daunting challenges of sustainable development—inclusive economic growth that promotes full and productive employment for all while safeguarding the fragile biosphere and mitigating the effects of climate change—require the concerted action of all governance partners to produce desired outcomes.

For the 2014 *Survey*, the United Nations expanded the assessment of e-participation by reviewing the quality and usefulness of e-government programs for the purpose of engaging people in public policy-making and implementation. In general, the *UN E-Government Survey* deals with the facilities for the three levels of e-participation (e-information/e-consultation/e-decision-making) rather than actually measuring usage.

The 2014 *Survey* introduced updates to the 2012 *Survey* questions on e-participation as well as introduced new questions. The updates ensured that information on whether up-to-date web tools were made available or not during e-consultation and e-decision-making activities by government agencies could be assessed. New questions addressed data publishing and sharing[3] by government agencies. Other new features and updates included the availability of information on the citizens' rights to access government information, providing outcome on feedback received from citizens concerning the improvement of its online services, providing the tools in order to obtain public opinion for public policy deliberation through social media, online polls, petition tools, voting tools, online-bulletin boards and online discussion forums.

As in the past, the *Survey* started its assessment with the basic premise that governments should provide archived information (e.g. policies, budget, legal docu-

ments, etc.) on its activities. As mentioned, the *Survey* researchers also focused on the availability of government data at this stage. In later stages, the researchers focused on the presence of e-consultation and e-decision-making features regarding education, health, finance, social welfare, labour information and environment. Table 3.1 summarizes the main features assessed for e-participation.

Table 3.1. Summary of features assessed related to e-participation

• Existence of archived information (policies, budget, legal documents etc.) related to education, health, finance, social welfare, labour information and environment
• Existence of datasets on education, health, finance such as government spending, social welfare, labour information and environment
• Access to government website in more than one official national language
• Availability of social networking features
• Presence of e-consultation mechanisms for the six sectors: education, health, finance, social welfare, labour information and environment
• Availability of tools in order to obtain raw (non-deliberative) public opinion for public policy deliberation such as online forums, media tools, polls, voting tolls and petition tools
• Presence of e-decision-making tools for the six sectors: education, health, finance, social welfare, labour information and environment

3.3. Global and regional ranking

Based on an assessment of these e-participation features in national portals and social networking sites, a global ranking of government provisions was established. Table 3.2 presents the top 50 performers (see Annexes, Table 13).

As in 2012, the Netherlands and the Republic of Korea topped the list of performers in e-participation. Uruguay came in third place, followed by France, Japan, the United Kingdom, Australia, Chile, the United States of America and Singapore.

Figure 3.1 illustrates the regional representation of the top 50 countries on e-participation. There are 21 countries from Europe, 14 from Asia, 10 from Americas, 3 from Africa and 2 from Oceania. Morocco, Kenya and Tunisia are the African countries in the top 50. If comparing only the top 20 ranking (involving 21 countries in 2014 with some with the same ranking), the most represented regions are tied among the Americas, Asia and Europe with six countries each.

Figure 3.2 shows the distribution of the top 50 countries according to income level. As seen, 56 per cent (or 28 countries accordingly) of the top 50 countries are high income and 28 per cent (14 countries) are upper middle income. There are seven lower middle income countries in the top 50, which are Morocco, Mongolia, Sri Lanka, India, Republic of Moldova, El Salvador and Georgia and one low income country (Kenya).

Table 3.2. Top 50 performers on e-participation

Netherlands	Colombia	Spain	Norway	Belgium
Republic of Korea	Israel	Estonia	Russian Federation	India
Uruguay	United Arab Emirates	Kazakhstan	China	Republic of Moldova
France	Bahrain	Brazil	Ireland	Slovakia
Japan	Canada	Finland	Kenya	El Salvador
United Kingdom	Costa Rica	Germany	Lithuania	Mexico
Australia	Greece	Latvia	Portugal	Qatar
Chile	Morocco	Oman	Sri Lanka	Sweden
United States of America	Italy	Peru	Tunisia	Georgia
Singapore	New Zealand	Mongolia	Austria	Montenegro

Figure 3.1. Top 50 countries on e-participation, by region

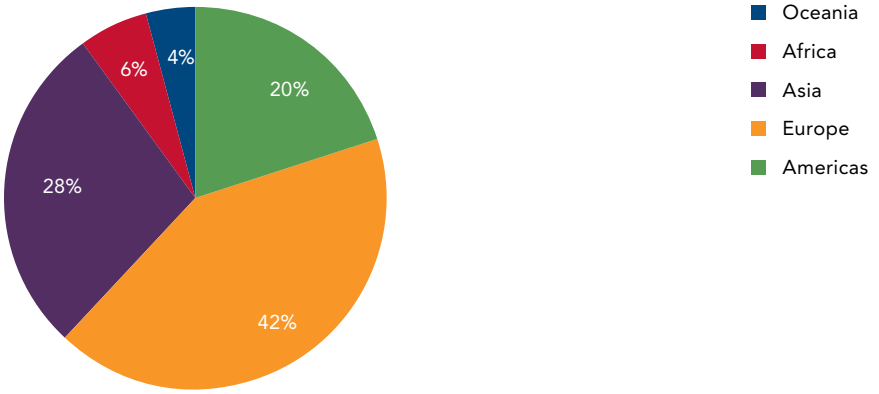


Figure 3.2. Top 50 countries on e-participation, by income level

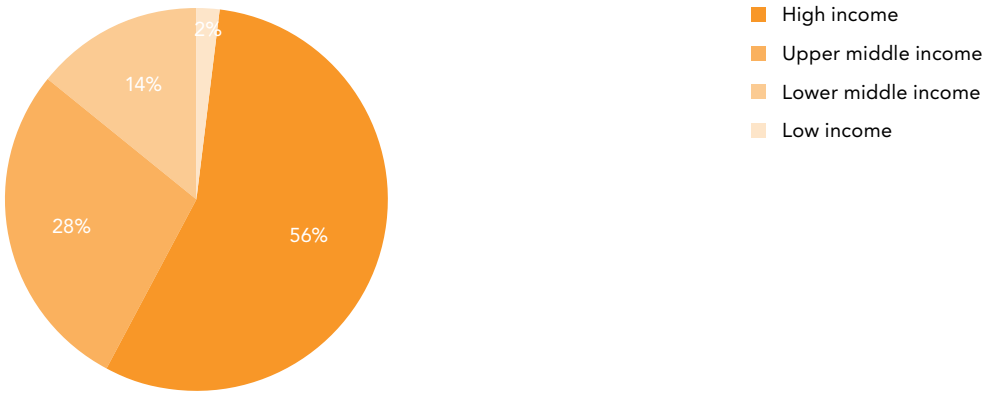


Table 3.3 lists the countries that score more than 66.6 per cent in all three stages of e-participation. These are all high income countries except for Colombia, which is an upper middle income country. The table shows that income level is important for e-participation, and it also implies that there are not many countries in the world which can achieve this. The top two countries, the Netherlands and the Republic of Korea, tied with an average total score of 90 per cent provision of all the services assessed.

Table 3.3. Countries that score more than 66.6 per cent in all three stages of e-participation

Country	*E-information (%)*	*E-consultation (%)*	*E-decision making (%)*	*Total (%)*	*Income level*	*Region*
Netherlands	96.30	86.36	77.78	89.66	High	Europe
Republic of Korea	96.30	81.82	88.89	89.66	High	Asia
Uruguay	88.89	95.45	66.67	87.93	High	Americas
France	96.30	77.27	77.78	86.21	High	Europe
Japan	85.19	86.36	88.89	86.21	High	Asia
United Kingdom	96.30	77.27	77.78	86.21	High	Europe
Australia	92.59	77.27	77.78	84.48	High	Oceania
Colombia	74.07	81.82	88.89	79.31	Upper middle	Americas

Equally noteworthy are those countries that offered the greatest number of e-decision-making services. They represent features that allow for the most active participation by citizens in influencing decision-making about public policies and services. Three countries, the Republic of Korea, Japan and Colombia, offered the greatest number of e-decision-making features at 89 per cent each.

3.4. Trends by levels and sectors of e-participation

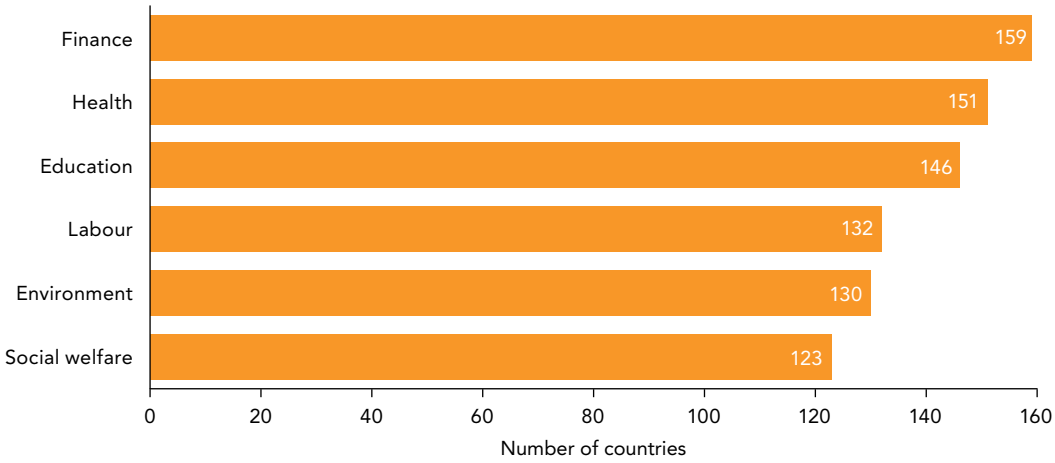
When government portals provide facilities for e-decision-making—such as a stated online e-participation policy; an online calendar of participatory events; online procurement announcements; online citizens' right to government information; and outcome of participation in a new policy, service or decision-making—they are beginning to empower citizens to meaningfully and effectively engage in public policies and co-produce public services.

The 2014 *Survey* looked at all three levels of e-participation (e-information sharing, e-consultation, e-participation) in sectors chosen on the basis of their relevance to the three pillars of sustainable development: economic, social and environmental. They include six sectors: education, health, finance, social welfare, labour and environment.

3.4.1. E-Information

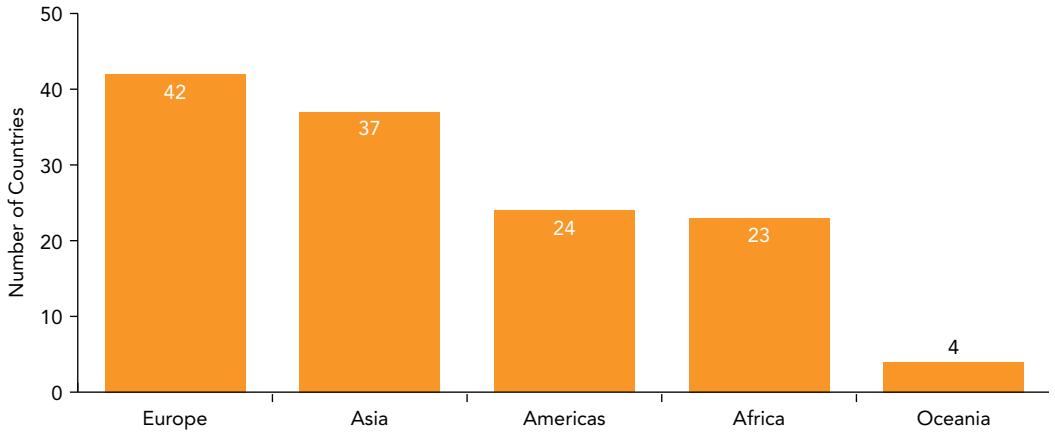
The number of countries providing archived information of the six chosen sectors is as follows: education (146), health (151), finance (159), social welfare (123), labour (132) and environment (130). 104 countries provide archived information about the six distinctive sectors, 22 countries do not share any information about the six sectors. Finally, there are five countries which share information in every sector except in the environment sector.[4] As seen in Figure 3.3, more countries provided links to sources of archived information such as policies, budgets, legal documents, etc. on the financial sector than the other five sectors. Increasing transparency of spending priorities and resource allocation can empower citizens to demand accountability, in a more informed way, for public expenditure.[5]

Figure 3.3. Archived information, by sector



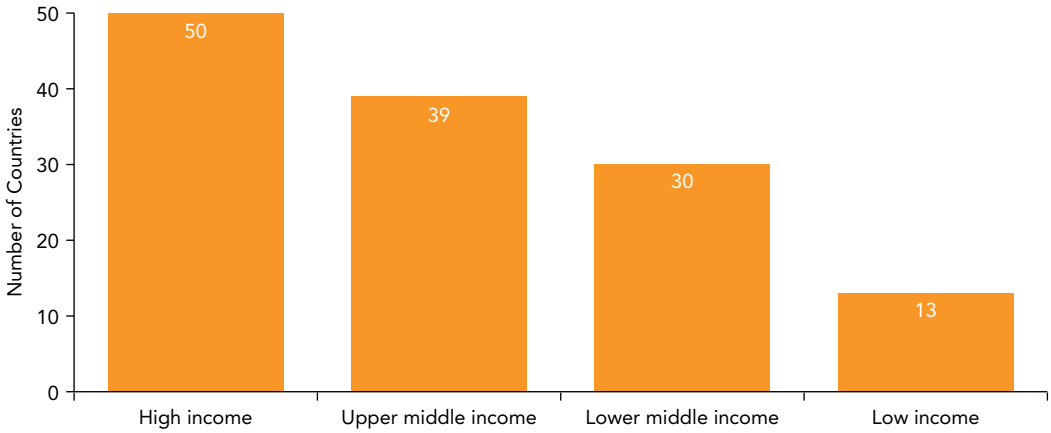
An increasing sector of concern for governments and citizens alike—given threats to biodiversity, depletion of fossil fuels and other minerals and climate change fallouts—is the environment sector. Figure 3.4 illustrates that the majority of the countries that deliver e-information on environmental issues are in Europe (42 countries). There is almost an equal number of countries from Africa and Americas (23 and 24 respectively) that also provide e-information on environmental issues.

Figure 3.4. Countries delivering environment information, by region



Furthermore, Figure 3.5 shows that the provision of this information is concentrated in the high and upper middle income countries (50 and 39 respectively). Given that the countries most susceptible to the negative impacts of environmental degradation generally tend to be low income countries, the provision of environmental e-information to the public in these countries is of increasing importance.[6]

Figure 3.5. Delivery of environment information, by income level



A successful example of e-information is highlighted in the Uganda case study (see Box 3.1).

Box 3.1. Ureport of Uganda: Mobile Participation

Ureport is a free, SMS-based system that allows young Ugandans to speak out on what is happening in communities across the country and work together with other community leaders for positive change. The mission of *Ureport* is to inspire action to unite and share the responsibility of creating a better environment for the society. It aims to inspire action from leaders and inform them about what is going on and what action the community prefers. *Ureport* includes but is not limited to:

- Weekly SMS messages and polls to and from a growing community of *Ureporters*
- Regular radio programmes that will broadcast stories gathered by *Ureport*
- Newspaper articles that will publish stories from the *Ureport* community.

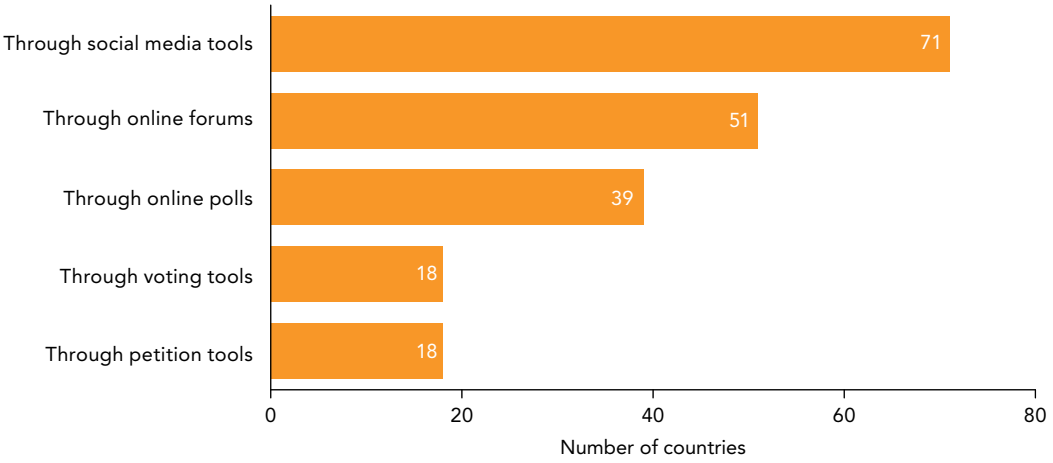
Source: Ureport: http://ureport.ug/

3.4.2. E-Consultation

A key factor that determines the design, deployment and use of particular citizen engagement technologies is the availability of adequate capacities, on both the side of the government and that of citizens. Figure 3.6 provides a comparison of tools used by governments for e-consultation. 95 countries, or 49 per cent, of the 193 United Nations Member States provide a facility on their national portals for

citizen feedback concerning the improvement of their online services. 71 countries provide raw or non deliberative public opinion on public policies through social media, 51 through online forums, 39 through online polls, 18 through online voting and 18 through online petitions. Fewer governments use tools for e-consultation than for the provision of e-information.

Figure 3.6. Tools used by governments for e-consultation



It is noteworthy that governments tend to use social media tools in a more extensive way than online forums. To give one example, the Government of Slovenia uses an online tool *predlagam.vladi.si* to interact with its citizens (see Box 3.2).

Box 3.2. Slovenia "I suggest to the government"

The online tool *predlagam.vladi.si* is managed by the Government Communication Office of Slovenia. Public officials from various government ministries are ready to respond to citizens' initiatives and evaluate their proposals. If they have any problems, questions or constructive suggestions for improving the functionality of online tools, citizens can e-mail and call the Government Communication Office. Online tools available for citizens include:

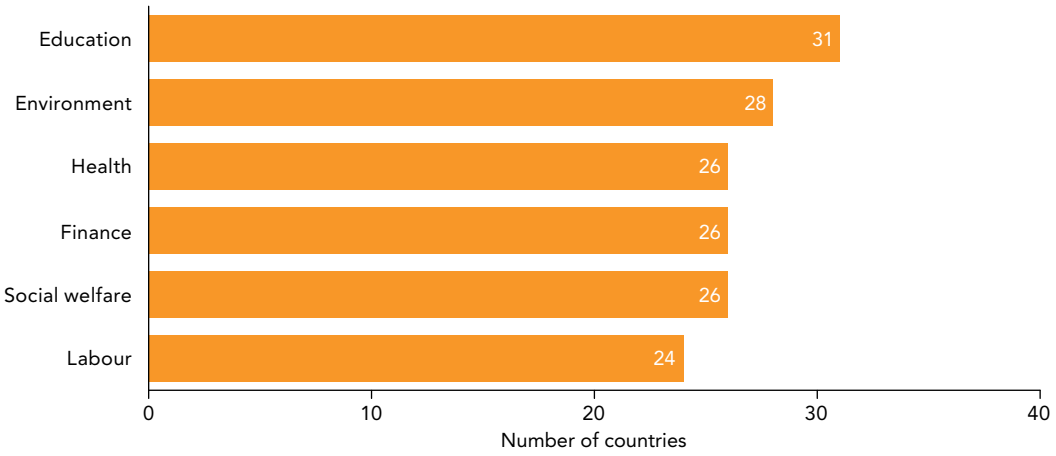
- facilitating publication of new proposals;
- informing the competent authority that the *predlagam.vladi.si* will open a debate on a proposal and ask the relevant party to take an active part in it; making sure that all comments are published according to the rules of *predlagam.vladi.si*;
- hiding inappropriate comments and in their place publishing the reasons;
- judging the adequacy of the response of the competent authority;
- publishing responses to the competent authorities.

Source: http://predlagam.vladi.si/

Governments tend to use social media for several reasons. First, the public is already very present and familiar with social media platforms such as Facebook and Twitter. These platforms provide an opportunity for governments to "leap-frog", bypassing having to set up their own platforms. Second, these are cost-efficient as social media initiatives do not require high investment costs, as they typically ride on commercial and non-governmental platforms.

Once these tools are in place, governments can also consult on sectoral issues that affect the quality of life of their people. This is a step beyond the simple provision of information, described above. The 2014 *Survey* assessed whether governments had e-consulted people on issues related to education, health, finance, social welfare, labour or the environment in the previous 12 months. More governments e-consulted on educational issues, with just over 16 per cent, followed by environmental issues, at over 14 per cent than the other four sectors (see Figure 3.7).[7]

Figure 3.7. E-consultation in the past 12 months, by sector



To keep up the momentum of citizen engagement, the responsiveness of public officials and administrators to e-participation is important. When people take the time from their busy lives to give feedback on or provide input into government decision-making, they should be acknowledged. However, given demographic differences between those public officials in decision-making positions and youth, it is important to build capacities in governments to bridge this gap. Otherwise, there is a danger that governments can be sidelined in online citizen-to-citizen dialogues and discussions.

The national portals were assessed for features that seek and use citizens' comments to improve online services. Table 3.4 illustrates that 68 out of the 193 United Nations Member States provided such features and 20 provided information about the outcome of citizens' feedback through statements explaining that the site had been upgraded based on the feedback received. Such features of e-decision-making can show elements of responsive improvements.[8]

Table 3.4. Consultation with citizens on improving e-government services

	Seek and use citizens' comments to improve its online services	*Provide outcome on feedback concerning improvement of its online services*
Number of countries	68	20

3.4.3. E-decision-making

Figure 3.8 provides a comparison of tools used by governments for e-decision-making on issues in sectors assessed in the past 12 months. Among the e-decision-making facilities, financial issues were provided by the largest numbers (14 countries or 7 per cent). However labour and health sectors were used by the smallest number of countries (5.2 per cent).

Figure 3.8. E-decision making features in the past 12 months, by sector

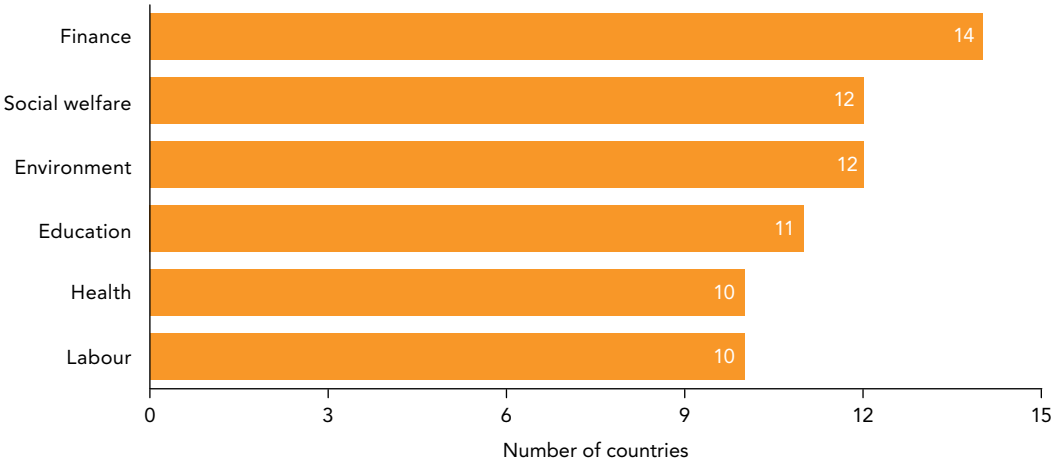
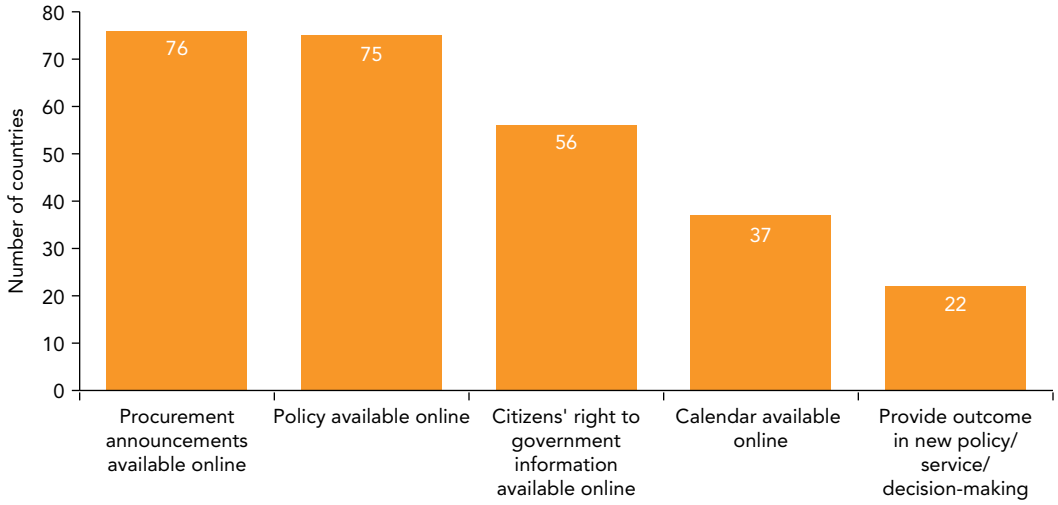


Figure 3.9 shows the extent of government's commitment to e-participation as indicated by an online e-participation policy, an online calendar of participatory events, online procurement announcements, online citizens' right to government information and outcome of participation in a new policy, service or decision-making. The greatest number of countries (76) allow for participation online in procurement announcements, followed by (75) placing their e-participation policy online. This trend demonstrates a steady progress in making available e-decision-making features.[9]

Figure 3.9. Countries with online e-participation policies



Even though governments may rank high on E-Government Development Index, they need to look separately at improving e-participation features if they wish to lay the foundation for soliciting active public participation. Although there is a high correlation between e-participation and other e-government features, other variables may be involved, such as income level and thus influence high e-government and e-participation scores.

3.5. The potential of e-participation for sustainable development: opportunities and challenges

3.5.1. Enabling environment for e-participation

Careful strategies are needed to create an enabling environment for e-participation. These strategies include legal and institutional frameworks by governments, capacity-development for digital media literacy for citizens and a seamless integration of online and offline features for enabling public participation. Successful strategies also address both formal and informal approaches to citizen engagement.

Governments may designate independent offices or create independent functions to introduce or improve freedom of information legislation, privacy and data protection legislation.

In doing so, it is helpful to build and capitalize on existing e-government initiatives—infrastructure and related e-services while undertaking new e-participation initiatives. Governments may be pressured to make budgetary cuts for their support to e-participation features during times of fiscal austerity. However, without proper consultations with people or managing societal expectations, public trust in e-participation services may be undermined.

Digital media literacy can facilitate e-participation by increasing the capacity of people. In order to be an effective e-participant, the inclusion of digital media literacy and lifelong learning efforts should become a social norm. Such literacy also includes the formation of relevant attitudes, development of skills and transfer of knowledge.

Social media initiatives around the world are good examples of how digital media can be used for the advancement of e-participation, creatively and attractively. Social media brings opportunities for cost-effective ways for governments to engage with citizens in e-decision-making and co-creation of services, especially since many citizens are already on popular sites. They provide platforms that enable citizens to become content creators for public policies (one good illustration is crowdsourcing) and services that governments can tap, providing a wealth of information.

Governments can develop a strategy for utilizing citizen-generated content for policy-making and service enhancement processes. However, it is not only social media and web sites that matter for successful e-participation. Traditional communications means and tools—such as radio, television, seminars, workshops, schools, universities, talk shows, face-to-face debates—combined with digital means, can help make public engagement more productive.

The use of all kinds of public media, including traditional offline channels, can be integrated into e-participation initiatives for further advancement. In this respect, the use and creative adaptation of existing local traditions of face-to-face public deliberations may be encouraged and "digitized" as part of e-participation measures. In addition, public media can be utilized in raising public awareness and direct education of both citizens and government officials.

Together with more traditional technologies—e.g. dedicated web-sites, universal One Stop Shop portals or Internet discussion forums based on Web 2.0 functionalities—they form a pool of public engagement technologies, old and new.

As the technology becomes more complex and sophisticated, it will bring to life business networks as third-party intermediaries to support new business models. The network of goods and services will be based on business partnerships and become increasingly data-driven, personalized and web-oriented. The engagement of business support services will be inevitable. Such new technological and business opportunities will be invaluable to the empowerment of disadvantaged and vulnerable groups through a new generation of online services driven by data-based architecture.

3.5.2. Readiness for e-participation

One key to a government's success in e-participation is to self-assess its readiness to undertake such initiatives. A possible assessment framework could define what is measured and consider political/ administrative, social and technical perspectives. The administrative side may be represented by legal/organisational frameworks, modalities/channels and outreach plans. The social dimension should consider e-participation levels such as e-information, e-consultation and e-decision-making. The technical perspective of e-participation considers specific citizen engagement technologies present in the field of open government/ data, social media, mobile/wireless communications and dedicated web sites/ portals. The assessment should include how e-participation provisions link with traditional offline channels, both complementing these and extending their overall reach and impact.

Periodic assessment would allow governments to not only monitor progress against the framework but also open up the possibility to compare themselves to others that also use the framework. More importantly, as difficult as it is to measure, the assessment should not only look at "readiness" but also examine the actual impact on governance and sustainable development.

3.6. Conclusion

Formal and informal institutions for e-participation must work effectively to reach out to all. Constitutions, national bills of rights and other legislation may need to be updated to cover the digital arena for the right for access to information, the right to petition, the right to take part in referenda, among other rights to participate in public affairs. Enabling legislation that provides freedom of information or protects the privacy of individuals can also include online protections.

However, without designated public institutions to implement the measures and procedures to guide citizens, these rights would remain only as legal protections and not be translated into civic realities. Informal institutions such as social networks and allied e-business interests, among others, are also important for promoting e-inclusion.

To increase the chance of success for their e-participation strategy, governments can benefit from those platforms and channels that are being used by citizens rather than creating new ones. Promoting a clear idea and understanding of e-participation will help those groups that are difficult to reach. They should encourage issues-related participation and provide consistent feedback on consultations to the public.

Through e-participation, ICTs can help governments become better listeners and more agile partners in sustainable development efforts. Participatory budgeting, data mining and interaction on social media allow public managers and policy-makers to take the pulse of a constituency and shape public services to more closely address the needs and aspirations of people. Newer methods of outreach, such as crowdsourcing, can be effective methods of communication at the local level.[10]

Given these conclusions, the following recommendations will contribute to an environment for successful e-participation for sustainable development:

- Setup legal and institutional frameworks to enable freedom of information, privacy and data protection in order to secure a safe environment for e-participation
- Empower people through capacity development for digital media literacy to educate citizens and foster the development of skills, transfer of knowledge and outreach initiated by the public
- Build on existing e-government initiatives, platforms and channels already used by citizens to create visibility, a stronger relationship and trust with the public at low cost
- Promote the use of ICTs, digital and social media tools to enhance the spread of information and citizen engagement
- Ensure the integration of offline and online communication tools for an inclusive policy-making and service enhancements.

Whole of government and collaborative governance

4.1. Introduction

The growing complexity and interconnectedness of present sustainable development challenges require holistic responses that are based on coherent policies and collaborative decision-making processes, which in turn call for a transformation of public administration through the adoption of whole-of-government approaches and collaborative governance. Whole-of-government can be defined as "agencies working across portfolio boundaries to jointly achieve integrated responses to the issues of policy development, program management and service delivery" (Ojo et al., page 234, 2011) whereas collaborative governance refers to a process of governing based on collaboration between government and non-government stakeholders.

This chapter analyzes why whole-of-government approaches and collaborative governance can play an important role in promoting integrated approaches to sustainable development. It also highlights opportunities and challenges, as well as enabling factors and strategies of effective whole-of-government approaches and collaborative governance. While technology is a critical enabler for greater vertical and horizontal coordination and collaboration among government agencies and governance actors, the chapter underscores that transforming government entails collaborative leadership at all levels; a government-wide shared vision and strategy to promote sustainable development; capacities and mind-sets that promote an inclusive organizational culture; innovative institutional frameworks and processes for collaboration and effective integrated information management systems.

In this chapter:

Chapter 4

4.2. The critical role of whole of government to promote holistic and integrated approaches to sustainable development

While social, economic and environmental challenges have significantly changed over the past decades and are becoming increasingly interdependent, government institutions and their functioning in many countries are still greatly shaped by early 20th century models of public administration whereby ministries work in "silos" and issues are tackled through a sectoral perspective. As outlined in the United Nations General Assembly resolution 66/288, it is critical to enhance integration of the three dimensions of sustainable development, i.e. economic, social and environmental, in a holistic and cross-sectorial manner at all levels. Effective collaboration among agencies across government (national and sub-national) and with non-governmental actors is essential to good governance for a number of reasons.

First, present development challenges, such as poverty eradication, environmental sustainability, disaster prevention and crisis management, call for holistic responses and investments in cross-cutting areas. No single ministry or government department can effectively deal with issues, such as poverty eradication, that are multi-faceted and have multiple root causes. Collaboration is therefore required to effectively address issues that go beyond the capability of any single agency or level of government.

Second, an increase in citizens' expectations for effective, equitable and citizen-centric services demands a shift from inward, disjointed and process oriented organizational structures to highly collaborative frameworks for seamless delivery of services and enhanced development impact. Governments can no longer provide services unilaterally and disregard citizens' demands for a more efficient and accountable use of public funds, which can result from service integration. In fact, the need to find ways that more effectively create public value, in an environment of constant change, has become an ongoing endeavour of all governments around the world.

Third, increased citizen demands for meaningful participation in public affairs and decision-making processes call for innovative governance and collaborative mechanisms that allow people to actively take part in decisions that affect their lives. Citizens (and other non-governmental actors) can be involved in the co-creation of services, including their design and delivery, as well as in finding solutions to societal challenges (see Chapter 3).

Fourth, government systems, institutions and processes need to adapt to a rapidly evolving information age by promoting effective knowledge management at all levels and by leveraging the potential of ICT for development, which also calls for enhanced cross-sectoral cooperation and collaboration at all levels of government both national and local.

Fifth, a number of international issues, including globalization, global warming, as well as maintaining peace and security, require holistic responses and inter-governmental cooperation at the national and global levels because of their

complex and inter-dependent nature. Also, even where issues/challenges are not in essence cross-border, most countries have very similar problems and international learning is essential, not to replicate solutions from elsewhere but to adapt to local circumstances, become inspired and learn together.

Governments are faced with 3 main domestic challenges
• More inclusive and higher quality services with less resources and increased holistic government capacities
• More open, transparent, accountable and effective public governance
• Responsive to increased citizen demand for enhanced participation building greater trust in government

This kind of change requires a transformation of the government as a whole, which calls for a holistic vision of development, new government institutional arrangements, leadership and human resources' capacities and mechanisms for greater collaboration among government agencies and departments and with other governance actors through a whole-of-government approach and collaborative governance. A new vision and model of collaboration among governance actors, in turn, calls for a paradigm shift in the role of the public sector whereby governments:

- Become catalysts for change instead of mere service providers;
- Facilitate networked co-responsibility by empowering communities to take part in the solution of their own problems;
- Become entrepreneurial in generating revenues and promoting partnerships;
- Operate in an integrated and collaborative manner across departments and agencies;
- Become pro-active instead of reactive anticipating problems;
- Make full use of opportunities afforded by the application of ICT in Government in order to bridge the digital divide
- Transform mind-sets and build a culture of collaboration, transparency and accountability.

4.3. Opportunities and challenges of designing and implementing a whole-of-government approach to service delivery

Several governments across the world are adopting whole-of-government and collaborative approaches through the promotion of horizontal and/or vertical initiatives, greatly aided by modern technologies, which provide useful tools to enable collaboration across agencies.

Whole-of-government and collaborative governance presents multiple opportunities, including:

- Increased effectiveness of government's responses—more effective and coordinated policy responses to complex issues;
- Enhanced efficiency by reducing duplications of processes and procedures in programme management and service delivery;
- Better service delivery by integrating services and thereby saving time and resources and increasing citizens' trust in government. Governments can also take a more positive stance towards citizens and trust that citizens can be valuable partners in co-creating public value, including service delivery;
- Increased public value by promoting collaboration and coordination with private sector and civil society in the delivery of services and wealth creation through social innovation.

Greater communication and coordination among policy areas and agencies at all levels, are helping governments deliver "as one" in pursuit of increased quality of and inclusive access to services to the benefit of its citizens. While the opportunities to develop and implement whole-of-government are many, so are the challenges as this kind of government transformation is usually associated with the most advanced stages of e-government development.

First, it is important to bear in mind that whole-of-government is not an end in itself but rather a means to achieve goals in a collaborative manner. In the case of service delivery, there are four main principles that can guide efforts in service delivery integration as follows:

- High quality—High quality service delivery may be manifested in—but is not limited to—the availability of government services at times and in ways that are more convenient to the public, speedy processing of applications or claims, reduction in the amount of paperwork and other activities citizens must perform in order to demonstrate compliance of clearly written government regulations
- Easy Access—such as the expansion of the coverage or enhancement of quality service delivery to disadvantaged and vulnerable groups is critical to inclusive social development
- Cost-effective—Utilizing the most economic models for delivering quality services to the citizens and ensuring effective delivery is essential, particularly in times of financial crisis
- Citizen-centric—Utilizing mechanisms that have proven to collect feed-back from citizens and that succeed in engaging them in the delivery of services.

Second, it is equally important to underscore that collaboration across government departments and agencies, as well as integration of services is not always the right solution. Collaboration can be time-consuming and can lead to counterproductive results if leaders are not able to appropriately direct collaborative efforts and ineffective mechanisms are in place. Moreover, integrating services may not always be the right solution in a specific area and for a specific target group. Therefore, it is always important to assess each situation and analyze whether collaboration is needed and integrated services provide enhanced benefits to citi-

zens. It is crucial to keep in mind the end result, viability, sustainability and impact of integrating services. Integration of services should be seen as a means and not as an end in itself. For example, according to the World Health Organization:[1]

Integrated health service delivery is *"the organization and management of health services so that people get the care they need, when they need it, in ways that are user-friendly, achieve the desired results and provide value for money."*

Integration may not always bring about quality of services and major factors need to be assessed before proceeding in this respect.

Third, it is well known that collaboration among agencies and government levels is not always a simple task. The greatest challenge to the adoption of whole-of-government, which fundamentally rests on increased collaboration, is resistance to change among government actors. Scepticism about integration of information and data privacy; lack of trust among agencies; non alignment of motivations among agencies or worst competition among ministries and agencies; different vision, priorities and goals among government agencies are all factors that can greatly inhibit the success of a whole-of-government strategy. While technology has increased the opportunities for connectivity and enabling new forms of teamwork, collaboration across departments and agencies can be very limited in scope without the right kind of leadership. As governments are steadily moving away from inter-organizational work modalities and moving towards intra-organizational processes, it is important to be aware of the difficulties that are intrinsic in this transition.

In sum, there are a number of political, organizational and technical challenges, which may hinder a more collaborative approach in government and with outside actors:

- Lack of a coherent vision and commitment to address sustainable development issues;
- Weak collaborative leadership and "silos" like mentality;
- Entrenched power structures;
- Vertical and horizontal organizational fragmentation;
- Inadequate accountability mechanisms for cross-agency collaboration and where appropriate, minimum or "appropriate" quality standards;
- Mistrust among ministries/agencies;
- Lack of confidence in the IT infrastructure, data privacy and security.

4.4. Transforming government through a whole-of-government approach: enabling factors

In order to deliver services in an integrated and seamless way and foster an innovative approach to complex problem solving, government agencies need to define clear shared outcomes, design agreed upon strategies, clearly define agency roles and responsibilities, compatible policies and procedures across agencies and ensure effective monitoring and evaluation mechanisms. This, in

turn, requires that four major and inter-twined dimensions of the public sector be strengthened, namely (1) collaborative leadership and human resources capacities; (2) institutional frameworks for effective coordination, cooperation and accountability; (3) innovative integrated processes and mechanisms for service delivery and citizen engagement and empowerment; as well as (4) IT management strategies for enhanced collaboration.

4.4.1. Critical role of collaborative leadership and a shared organizational culture

Strengthening collaborative leadership capacities at both national and local levels is a prerequisite for creating an environment where collaboration thrives and government officials learn to work and think in collaborative ways. Improvements are made and innovation spurs when leaders are able to mobilize stakeholders towards a common shared goal. Collaborative leadership may be defined as the capacity of leaders to work across organizational boundaries to inspire, engage and motivate people and teams to work together in pursuit of common goals.

Collaborative leaders require strong skills in setting an example and modelling collaboration through their own behaviour; acting as mediators and connecting citizens' aspirations and vision with organizational structures and capacities to produce public value; attracting diverse talents and ensuring that accountability lines are clear and respected. Leaders must also work together to align services in a coherent manner.

In addition, it is important that government officials, particularly at the local level, have the appropriate attitudes, skills and expertise to harness ideas from diverse communities and to engage citizens through new collaborative channels and modalities. This is so because local governments are at the contact point between government and the people. This type of interaction between public officials and citizens requires new skills, attitudes and knowledge, as well as the capacity to utilize effectively social media, mobile and other ICT tools.

Shaping or re-shaping values, attitudes and behaviours in the public sector through mission statements and codes of conduct containing guiding principles can be an important step forward coupled with capacity-building activities that focus on collaborative governance. Public officials at different levels ought to take part in the redefinition of their mission statements and codes of conduct to enhance ownership as well as alignment of behaviours and values to a holistic view of government. In promoting human resources development in an innovative public sector, particular attention should be given to:

- Managing and working in increasingly hybrid organizations with overlapping teams;
- Building partnerships and negotiation skills;
- Designing IT strategies for collaboration and coordination.

Knowledge, skills, values and attitudes of staff at all levels need to be re-adjusted to match the functions, responsibilities and tasks as well as the new collaborative work methods. Continuous learning and adaptive leadership skills are also

required when governing under uncertainty and complexity. Greater empowerment of public officials and a more conscious and professional risk management are essential to foster innovative collaborative approaches (see Innovations in Governance and Public Administration: Replicating What Works, United Nations, 2006). While great attention is focused on changing the visible collective structures of governance institutions, attention ought also be given to how to re-align and leverage the internal/non visible side of governance institutions. Values, attitudes and mind-sets have a direct impact on behavior, relationships and partnerships, affecting institutions, organizations, policies and infrastructure.

Public managers can create value by strategically thinking about how to solve complex issues and by focusing on the impact of government's actions rather than focusing on internal processes. A new mind-set or organizational culture, which places emphasis on thinking beyond organizational boundaries rather than along departmental lines in tackling specific problems, is essential to improve service delivery. A culture of collaboration through knowledge management and sharing, increased transparency and accountability lies at the heart of promoting innovative and integrated services.

Transforming mind-sets and encouraging a collaborative organizational culture is, however, not simple per se and requires a coordinated strategy, buy-in from top leadership and time to change individual beliefs, attitudes and behaviour. Particular attention should therefore be placed on devising a set of incentives that can reward collaborative efforts and discourage working in silos. Besides ongoing learning and training in the above mentioned areas, stakeholders, within and outside of government, can be empowered and involved in defining the vision and overall benefits of specific collaborative efforts. An incentive system can include a number of elements, such as public recognition, rewards to teams rather than individuals for effectively meeting a common goal.

4.4.2. Institutional frameworks for effective coordination, cooperation and accountability

It is well known that collaboration and coordination among agencies cannot be developed in the absence of a supportive institutional infrastructure. Integrating services requires a re-organization of institutional frameworks, back office processes, accountability mechanisms and work modalities through whole-of-government approaches, which allow for integration. New organizational efforts ought to be aimed at developing processes and mechanisms that enable people to work together; define and build together a shared purpose; and promote a system of incentives and rewards that values collaboration.

While each agency continues to be accountable for its defined and focused role, cross-agency issues are addressed in a coordinated manner through new institutional and accountability frameworks and mechanisms. A coordinating authority in government that can facilitate and mobilize governance stakeholders towards designing and adopting whole-of-government approaches has emerged as an important catalyst for increased coordination.

The *United Nations E-Government Survey* has focused on Chief Information Officers (CIOs). The institutional level of CIOs as well as the office's functions, roles and responsibilities seems to have an important impact on the overall sustainability of whole-of-government approaches and collaborative governance. The importance of the CIO or its equivalent is to create a unified and centralized agency responsible for designing, implementing and disseminating e-government throughout the entire public administration in a seamless way.

CIOs that are integrated into the President's Office or Prime Minister's Office have a better opportunity to leverage knowledge, resources and above all commitment at all levels. It is also very important that CIOs do not work in isolation vis-a-vis other government institutions because e-government and whole of government is first and above all about transforming government and not solely about the application of technology. In some countries, there is a tendency to separate information management and issues related to the application of ICTs from the mainstream of public administration transformation, and this can only cause conflict and inefficiencies. It is therefore very important to devise organizational set ups that allow for collaboration among ministries and CIOs in their efforts to promote whole-of-government approaches.

The 2014 Survey questionnaire includes a set of questions to assess the level of whole-of-government in Member States. All sources of data used in this chapter come from this questionnaire, unless otherwise stated. According to this data, countries that scored more than 66.6 per cent in whole-of-government are mostly European, followed closely by Asia (see Table 4.1, Figure 4.1 and Figure 4.2). This analysis also falls in line with the data analysis of countries with a CIO or equivalent; proving that a unified, consistent and identifiable authority managing e-government can have a positive impact on a country's performance and the quality of their e-service delivery.

Table 4.1. Countries with a score higher than 66.6 per cent in whole of government

Albania	Armenia	Australia	Austria	Bahrain	Belgium
Brunei Darussalam	Canada	Chile	Denmark	Egypt	Estonia
Ethiopia	Finland	France	Ireland	Israel	Italy
Japan	Jordan	Kazakhstan	Kuwait	Latvia	Liechtenstein
Lithuania	Malaysia	Morocco	Netherlands	New Zealand	Norway
Portugal	Republic of Korea	Saudi Arabia	Seychelles	Singapore	Spain
Sri Lanka	Sudan	Sweden	Switzerland	Syrian Arab Republic	Tunisia
	Turkey	United Arab Emirates	United Kingdom of Great Britain and Northern Ireland	United States of America	

Figure 4.1. Countries with a score higher than 66.6 per cent in whole of government, by region

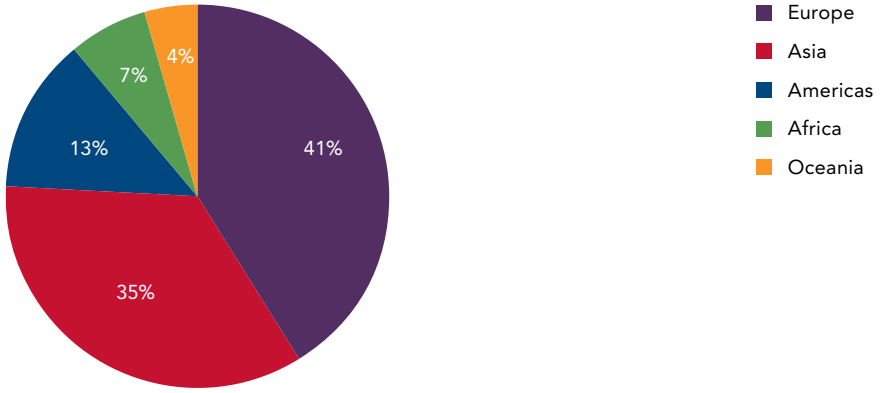
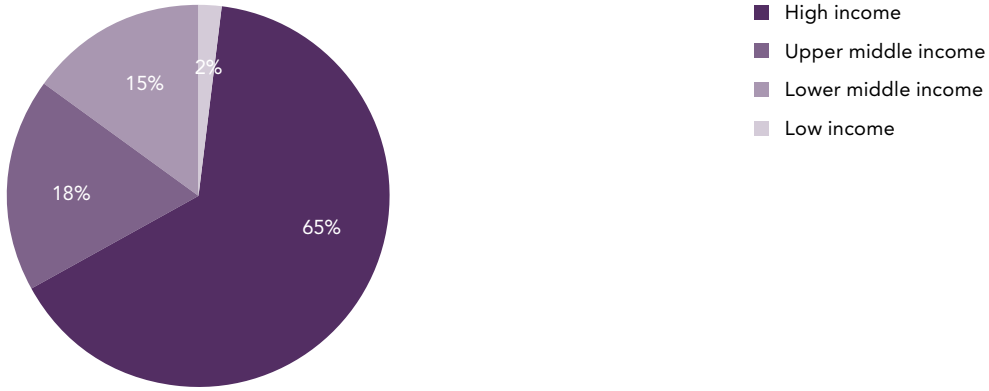


Figure 4.2. Countries with a score higher than 66.6 per cent in whole of government, by income group



Based on the data collected for the 2014 *Survey*, between the years 2008 and 2014, the number of countries publicizing information about a CIO has more than doubled. Hence, 42 per cent of United Nations Member States today provide information about their CIO for e-government (see Figure 4.3 and Table 4.2). This leadership role altogether is providing guidance and continuity for the development of e-services and for reaching a connected stage in online governance.

In terms of regional distribution, Europe is the leader with 56 per cent of European countries publicizing information about a CIO; followed closely by Asia at 51 per cent. 14 out of 35 United Nations Member States in the Americas have online information about an e-government CIO or equivalent, compared to 4 out of 14 Member States in Oceania. Africa lags behind the rest of the world in creating an entity responsible for its e-government strategy and designating a CIO, where only 16 out of 54 African countries have done so, or 30 per cent of the continent. The African region still faces many challenges in catching up with the rest of the world in online presence and connectivity, due to many socioeconomic and political factors.

Figure 4.3. Number of countries with online information about a CIO or equivalent

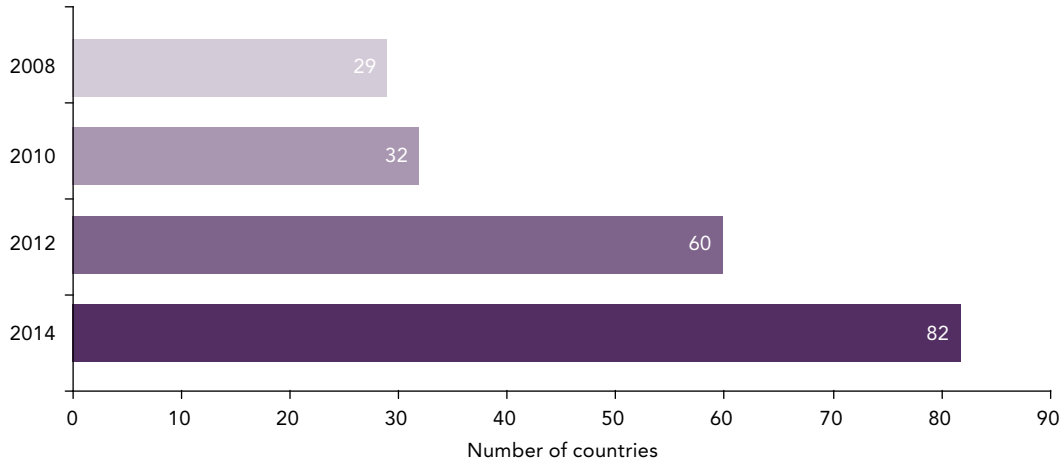


Table 4.2. Countries publicizing a CIO or equivalent by region, in 2014

	Countries publicizing a CIO or equivalent	*Number of countries in region*	*% of countries per region publicizing a CIO or equivalent*
Africa	16	54	30%
Americas	14	35	40%
Asia	24	47	51%
Europe	24	43	56%
Oceania	4	14	29%

4.4.3. Innovative coordination processes and mechanisms for service delivery and citizen engagement and empowerment

Process innovation focuses on the improvement of quality of public service delivery and entails new ways of designing processes by integrating services and ensuring that they are inclusive and accessible by all groups in society, including disadvantaged and vulnerable groups.

The *United Nations E-Government Survey 2012* chapter on "Taking a whole-of-government approach" referred to the concept of "one-stop government" defining it as the movement from isolated silos in public administration to formal and informal networks to respond to growing complexity of problems through collaborative responses. It touched upon the concept of e-government harmonization in practice by briefly making reference to the role of national coordinating authorities, particularly CIOs. It highlighted "the need for public sector interoperability, i.e. that systems deployed throughout the government are able to communicate with one another through interoperable technologies in order to share and integrate information by using common standards" (*United Nations E-Government Survey 2012*). In addition, it drew attention to the importance of online service integration through portals that aggregate large amounts of infor-

mation and services into a single web-site and the need for overall commitment. In particular, it looked at challenges and opportunities of integrated e-service delivery and signaled out a number of challenges and opportunities, including (*a*) revisiting institutional arrangements; (*b*) promoting citizen-centric designs; (*c*) standards setting and systems integration; (*d*) privacy and security matters; and (*e*) issues in infrastructure development.

"With public sectors offering an increased number of services, the focus is shifting from *what* kinds of services are provided to *how* they are provided. In many countries, a host of services provided, are increasingly coordinated and customized to better fit the needs of the citizens. In many instances, service delivery operations are integrated early in the value chain or services are bundled in a single entry point for the citizens" (*United Nations E-Government Survey 2012*). There are many examples of national portal features that are indicative of back-end integration and transformation. At its most basic level, this could mean lists and links to local government websites or other agencies, such as is the case in Australia, or result in a combined central portal, such as in the United Kingdom that recently integrated its Directgov and Business Link portals into one.[2] More advanced versions—and obvious examples of whole of government—come with specially designed portals that offer joint services through a single sign-on. For example, the Swedish business registration portal where three government agencies—the Swedish Companies Registration Office, the Swedish Tax Agency and the Swedish Agency for Economic and Regional Growth, have joined forces to enable entrepreneurs to logon and conduct services with all three agencies in one place.[3] In Denmark, the citizen portal offers a personalized account of information and services through a single sign-on.[4] Meanwhile, some, such as New Zealand, are moving ahead with an "all-of-government" approach that includes cloud computing, sometimes labelled the g-cloud (for government cloud).[5] Such clouds can directly benefit, and build upon, whole-of-government initiatives, and may be the latest trend in this area, evident also in Singapore[6] (United Nations Expert Group Meeting Report 2013 on Collaborative Governance).

In the Philippines, gender and development mainstreaming efforts led to the creation of the Davao Medical Center, which, in turn, set up the Women and Children Protection Unit (WCPU)—a one-stop family crisis intervention centre, which provides legal, psychiatric and medical services to its patients. In Brazil, the Bahia's Citizen Assistance Service Centers (SAC) bring together over 500 federal, state, and municipal agencies in a single location, convenient to the public such as shopping malls and major public transportation hubs, to offer multiple government services. There are many other good practices of client-focused one-stop service delivery for social services and mobile service delivery for multi-service clients in remote areas. The Korea's Integrated Financial Management Information System established by the Ministry of Strategy and Finance is another example of whole-of-government approach (see Box 4.1).

As the national portal is considered the citizens gateway to online government, it is important to provide such links in a way that allows users to access websites of different government agencies as easy a way as possible. Citizens seeking

specific services or information can rapidly access the respective website without having to memorize URLs or using search engines to access the ministries or departments' websites. This allows for broader usage and higher satisfaction with the services offered. Citizens often do not spend an excessive amount of time or effort looking for services online. "One-click" links are the most suitable way to maximize efficiency in service delivery and minimize tasks that could be time-consuming.

2013 United Nations Public Service Award Winner

Source: https://eng.digital-brain.go.kr/en/view/main/index.jsp

Box 4.1. DBAS: Korea's integrated financial management information system (Ministry of Strategy and Finance)

The Digital Budget and Accounting System (DBAS) is a good example to consider as it integrates all the existing financial systems and provides transparency in public finance. It is an innovative tool that manages the entire fiscal process, ranging from budget formulation to accounting and integrates fiscal information by linking fiscal information of all public entities. The system is also known as "dBrain," because of its function as the digital brain for fiscal management. The most distinctive feature of the DBAS is that it allows a holistic view of public finance. It consolidates fiscal processes of fifty-one central government agencies and links fifty-five external systems and local governments, public entities and subordinate organizations, fulfilling the requirements of the IMF's 2001 Government Finance Statistics (GFS) Manual. The system further reinforces risk managing capacity by enabling real-time information sharing in public finance, such as revenues, expenditures, national assets and public debts.

Source: http://www.id.gov.ae/en/id-card/id-card-benefits.aspx

Box 4.2. Emirates ID Authority Smart ID Cards

The deployment of the Emirates ID Authority's Biometric Enrolment by the Emirates ID Authority as part of the National ID Registration Program is recognized as one of the world's best biometric programs. Emirates ID Authority collects finger prints of all the citizens and legal residents above the age of 15 in the country. It is mandatory for everyone residing in the country to be registered in the National Population Register. Considering the unique demographic composition of the country where expatriates amount to nearly 90 per cent of the population, the biometric enrolment is part of the mandatory health certification for all expatriates, making it convenient for the residents.

The current database boasts of over a 105 million prints of rolled fingerprints, plan and hand side prints, in addition to over 15 million facial images. The best two finger prints are stored in a secure, encrypted container in the Smart Card that is issued as the National ID Card. The Smart Card is provided with a Match-On-Card Applet which allows for a biometric verification and authentication enabling assertion of an individual's identity on demand. The security on the ID Card is ensured by the encrypted containers which is enabled only through the National Validation Gateway. All the biometrics, data transmission and protocols are as per ANSI and/or ISO Standards.

Box 4.3. National Environment Agency Singapore (NEA)

The National Environment Agency has partnered with the people, public and private communities to engage and promote greater environment ownership in Singapore. One effort is the use of smart technologies to share environmental data (e.g. air quality, public health and weather) with government agencies and the public. NEA contributed to the development of 86 environment datasets and 17 spatial datasets for the Singapore Government data hub, SG-Data/GeoSpace, for inter-agency sharing. These datasets include weather information such as air quality, weather forecast, heavy rain warning, climate change, location of recycling bins. It also contributed 75 datasets and 8 map layers to the Singapore Government's one-stop portal service, www.data.gov.sg, for public use. Using smart phone technologies, NEA has co-created several mobile applications with private sector partners through crowd sourcing ideas from the public to promote greater environment ownership and provide real time information on environmental conditions.

2013 United Nations Public Service Award Winner

Source: http://app2.nea.gov.sg/

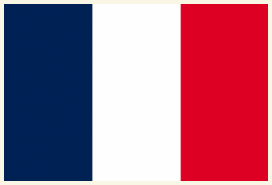
Based on the 2014 *Survey* data, it is clear from the Table 4.3 that the majority of the online portals of Member States provide links to the websites of various ministries or departments; with only 26 countries, or 13 per cent not having such links. 17 countries provided links to 1 to 5 ministries or departments, 12 countries provided links to 6 to 10 ministries or departments and the majority (138 countries), that is 72 per cent, provided links to more than 10 ministries or departments. This number is higher compared to the 2012 data where 123 countries (64 per cent of United Nations Member States) provided more than 10 links.

Table 4.3. Countries with online portals with links to ministries

	Countries with no links to ministries	*Countries with 1–5 Links*	*Countries with 6–10 Links*	*Countries with more than 10 inks*
Africa	14	9	4	27
Asia	2	3	3	39
Europe	2	0	3	38
Americas	2	2	2	29
Oceania	6	3	0	5

In the 2012 *United Nations E-Government Survey*, 135 countries offered a "One-Stop-Shop" portal. The definition of such a portal was broader in 2012 and did allow for more leeway in what could be accounted for as a "One-Stop-Shop" portal. This number represented 70 per cent of Member States.

In 2014, the definition of "One-Stop-Shop" has been revised and made more restrictive and narrow. Hence the number of countries that still classified as offering such portals was reduced to 71 countries, or 37 per cent of Member States. However, even with a more restricting definition, the global trend has been a shift away from "One-Stop-Shop" portals into various specialized portals.



Box 4.4. France: Access to numerous government entities through a single national page

In addition to the national portal, the Government has also developed an official website for the French civil service, www.service-public.fr, available to private citizens, businesses and professionals. All administrative information is presented clearly and simply in three sections: First, citizen's rights and procedures. There are about 200 folders, 2,500 data sheets and answers to FAQs and several thousand links to useful resources, including forms, online procedures, reference texts, public websites, etc. Second, practical services to help with administrative procedures, such as online services, calculation modules, downloadable forms, standard letters, call and contact centres and a message service; third, a civil service directory including 11,000 national services, 70,000 local civil services and accesses to the main portals of the States in the European Union, European institutions and international organisations. The official civil service website facilitates and simplifies access to administrative information by selecting the various resources available on the public network and organizing them to meet citizens' needs. For each topic, service-public.fr collects all the relevant information and makes it instantly available.

Source: http://service-public.fr/

4.4.4. Collaborative mechanisms to engage citizens in service delivery and decision-making processes: the critical role of decentralized governance

Given the opportunity to actively participate in service delivery, citizens can contribute distinctive resources (time, effort, ideas and expertise) and can keep public officials accountable. Moreover, citizens who depend on public services have strong motivation to contribute to their design and implementation; however, appropriate mechanisms are needed to adequately channel citizens' views, opinions and to involve them in the design and delivery of services and in solving the most pressing challenges of our times.

In other words, there is a strong paradigm shift in the role that civil society and the private sector can play in contributing to good governance. Whereas in the past citizens were seen as passive receivers of services and governments were the main providers of "solutions", today in all corners of the globe we witness a shift in how services are being conceptualized, managed and delivered. Where citizens are involved in public decision-making processes and in public service delivery, there is an increased sense of ownership and greater sustainability of public initiatives, as well as more creative ideas on how to do "more with less" and with greater equity.

Countries which have given priority to the involvement of civil society in identifying the social needs of local communities and citizens and in the implementation of social programmes and services, including education, health and sanitation, have made important strides. It is crucial to recognize that leadership is not confined to the government level. In fact, there are many examples of public leaders who operate within civil society and the private sector and work with governments to find suitable solutions to their problems. Experience has shown that

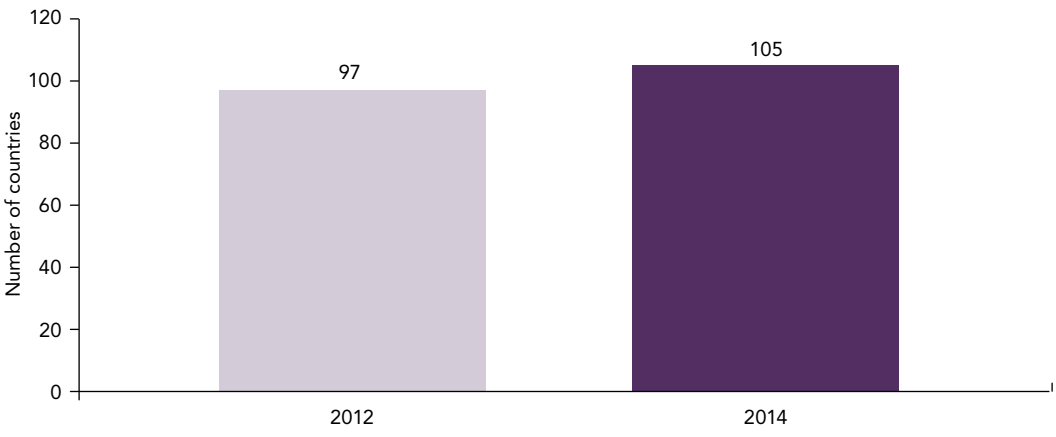
governments that have made progress in providing equitable and effective service delivery have developed innovative ideas and practices, making use, whenever possible, of information and communication technology, including social media and relying on strategic partnerships. Participatory leadership and innovation in addressing problems of public concern are increasingly emerging as the key factors in creating a better life for all.

One of the most effective institutional arrangements to allow citizens to effectively take part in decision-making processes as well as in the design, implementation, monitoring and evaluation of service delivery is through decentralized governance. Devolution and decentralization allows local communities to formulate solutions tailored to their particular needs: citizens know best what their needs are. Through decentralized governance structures, communities can play an active role in democracy and setting development agendas that are responsive to their needs. They can shape service provision through participating and influencing decisions on the type, quality and mix of services they desire and can afford. As a result, closer alignment is needed between national-level priorities and local action for sustainable development. In this regard, the capacity of local governments is crucial.

Overall, weak decentralized governance hinders quality and access to basic services. The increasing power of ICTs has opened up a vast window of opportunities for new channels and modalities of participation in government service delivery. Some examples include the 311 service from the city of New York, to Boston CitizenConnect and many others. The use of social media, crowdsourcing and mobile technology, are providing powerful channels, if appropriately utilized, for citizen participation and empowered collaboration. Open data is also enabling more effective collaborative governance as access to information about what governments are doing better equips citizens to partake in public decision-making processes.

A greater focus on whole-of-government approaches and collaborative governance is also clear in the 2014 *Survey* data showing national portals providing links to local or regional government websites. From 97 countries in 2012 to 105 in 2014, this increase proves that a growing number of countries are adopting a strategy aimed at bringing government agencies closer to the people (see Figure 4.4). By linking the national portal to local or regional government websites, states encourage their citizens to use services provided both at the national and local levels.

Figure 4.4. Portals linking to local/regional government websites



4.4.5. IT management strategies for enhanced collaboration

The global spread of the Internet and the application of ICTs in government, as well as greater investments in telecommunication infrastructure coupled with capacity-building in human capital can provide opportunities to transform public administration into an instrument of development at the service of its citizens.

A comprehensive IT strategy for collaboration in government and with appropriate outside actors is required in order to seize these opportunities. The strategy needs to be closely aligned with overall vision and mission of the government so that it can best respond to the needs of enhanced collaboration. An IT strategy that is disjointed from the overall organizational missions will not deliver the expected results. In order to effectively design and implement an IT management strategy for collaboration the following steps need to be taken:

- Engage main stakeholders (within and outside government) in defining an overall mission to be aligned with the overall vision of the public sector
- Assess the internal capacities to utilize the available technology
- Design a comprehensive strategy, including capacity building programmes
- Implement the IT strategy for collaboration
- Monitor and evaluate the strategy

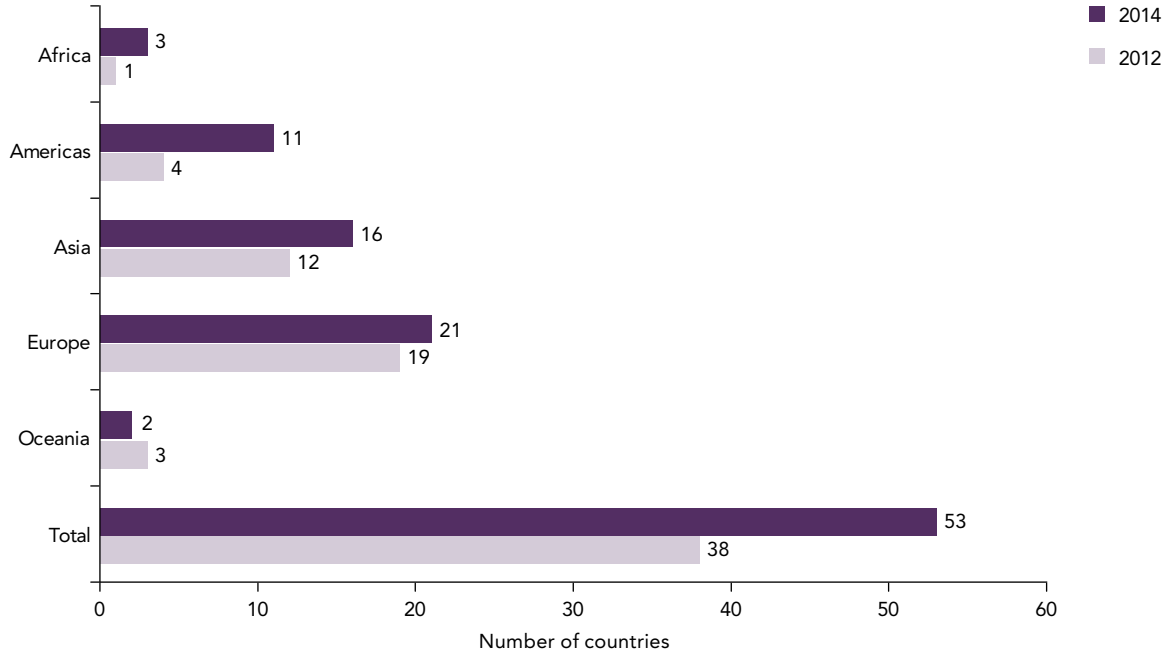
A key component of whole of government is "the ability of multiple government and non-government organizations to share and integrate information across their traditional organizational boundaries".[7] One of the greatest challenges to promoting effective collaborative governance is that too much emphasis has been placed on interoperability as being merely a technical issue. While technology certainly plays an important role, there are other important factors instrumental to effective collaboration and service integration.

It is also important to bear in mind that while the use of ICT has greatly improved service delivery and reduced the time needed for any government transaction to be processed, it is not without risks. As governments require personal and sometimes sensitive data to be shared electronically, such as social security numbers, bank accounts information for payment of fees and medical history profiles, the protection of such data is crucial in building trust in, and increasing the usage of, online services.

A key point of the back-end work is to create a seamless front-end experience for users. People do not have to know the agency, department or level of government providing the services but rather just be able to find it and use it in an effective manner.

Since 2012, there has been an increase in the number of online portals indicating a security feature. Europe is the leader in ICT security and protection with 21 countries providing a security feature, as opposed to 19 in 2012. Asia is second with 16 countries providing a security feature, followed by the Americas with 11 countries, Africa with three countries and Oceania with two countries. Globally, the total number of portals with a security feature jumped from 38 in 2012, to 53 in 2014 (see Figure 4.5).

Figure 4.5. Online portals indicating security features



The electronic identity management feature in national portals is an important way governments can regulate, monitor and standardize access to its online services. Citizens wishing to use e-services can access a vast range of online services through unique credentials that allow the system to recognize the user, tailor the services to his or her needs and allow easy and fast tracking of the status of transactions. Hence, users no longer have to memorize many credentials and usernames in order to access e-services. This feature is also beneficial to the government in that it allows all agencies, providing different services, to have coherent and cohesive and similar information about users. This reduces bureaucratic procedures, minimizes redundancies and replication within the agencies and maximizes the output to citizens. The number of countries offering such a feature has increased from 52 in 2012 to 69 in 2014, or an increase of 9 percentage points in 2 years (see Table 4.4). Figure 4.6 describes the number of government agencies using this feature at national level.

Table 4.4. Use of electronic identity management feature

	Electronic Identity Management	
	2012	*2014*
Number of countries	52	69
Global per centage	27%	36%

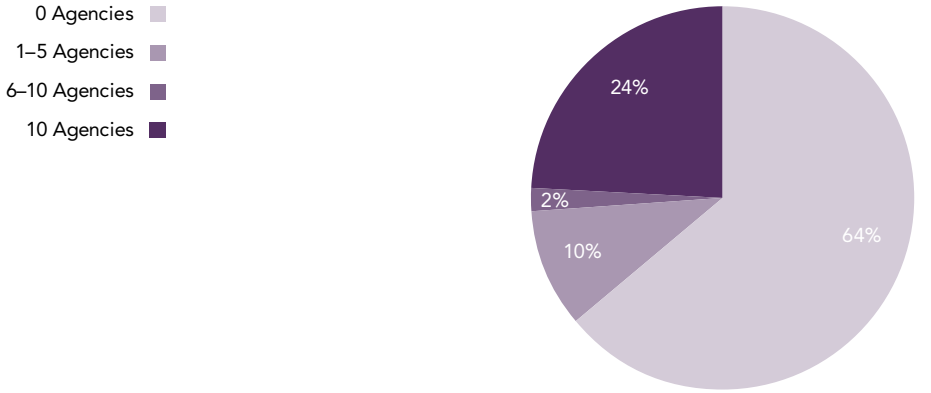
More than half of the United Nations Member States are providing links to e-procurement platforms or announcements for bidding processes on their national portals. 63 countries provide such features, with 55 Member States providing information about the results of procurement/bidding processes, 33 countries provide information about monitoring and evaluating existing contracts, and 54 countries provide an online tracking system for transactions and applications.

The high number of portals providing e-procurement platforms is an indicator that governments are moving away from a one-sided interaction between the public and the private sectors, where governments are the sole providers of services and information to citizens and businesses and are moving closer towards a 2-way interaction, where governments are also requesting services from the private sector through their online portal (see Table 4.5).

Table 4.5. Countries providing procurement announcements, evaluations and results

	Number of Countries	*% of total countries*
National portal(s) providing an e-procurement platform or a link to e-procurement announcements for bidding processes	63	33%
National portal(s) providing information about results of procurement/bidding processes	55	28%
National portal(s) providing any information about monitoring and evaluation of existing procurement contracts	33	17%
National portal(s) indicating an online tracking system for transactions such as applying for grants, permits etc.	54	28%

Figure 4.6. Number of government agencies using the same identity management feature at the national level



4.5. Conclusion

We are living in times characterized by high levels of inter-dependence, complexity and uncertainty with great challenges ahead but also many new opportunities offered by the rapid advancements in technological innovations and growing awareness of the potential of empowered societies and collaborative governance for sustainable development. To overcome the many multi-faceted challenges our societies face, including poverty eradication, climate change, social injustice, human rights violations, unemployment, among others, Governments are increasingly addressing economic, social and environmental issues in an integrated manner through a holistic transformation of government and by delivering services through integrated and citizen-centric whole-of-government approaches.

Governments in many parts of the world are becoming more collaborative, open and transparent, innovative and inclusive by engaging citizens, communities, NGOs and the private sector in devising and implementing together solutions to society's challenges. Collaborative governance, which can provide a sustainable framework for addressing the challenges of sustainable development, is not easy to implement, but the lessons learned from this Chapter can be summarized as follows:

- Develop a shared and holistic vision of sustainable development at the national level;
- Ensure political commitment;
- Put in place collaborative leadership and capacity development;
- Cultivate a collaborative organizational culture coupled with strong incentive systems;
- Establish new coordination institutional arrangements and processes with clearly defined roles and responsibilities and well-defined accountability mechanisms;
- Set up integrated IT management strategies;
- Work towards achieving a balance between openness and privacy;
- Mobilize resources.

A holistic government transformation enabled by greater levels of collaboration can present significant opportunities for more prosperous and empowered societies and for development that is sustainable for generations to come.

Mobile and other channels for inclusive multichannel service delivery

5.1. Introduction

Eradication of poverty remains high on the global development agenda and requires empowering people living in poverty and other disadvantaged and vulnerable groups[1] with public information and services. Different modalities and channels for extending public service delivery to all the people and leave no one behind including disadvantaged and vulnerable groups. The evolution of e-government in the next stage beyond 2015 needs further rethinking and transforming the way government institutions operate, with citizen needs and expectations at the core of its business re-engineering process. An integrated inclusive multichannel service delivery approach is, therefore, central to the successful implementation of the way forward.

Opportunities are available with information communication technologies (ICTs) evolving in transforming societies, cultures and economies. Over the past decade, the world has witnessed changes brought about by the rapid advancement of technologies such as the Internet and social media along with sophistication and convergence in hardware and software of the ICT ecosystem. Broadband connectivity, already pervasive in developed countries, is being rapidly deployed in emerging markets. Social networks have made profound changes and impacts on the ways people interact with one another and with their governments. Open government data and cloud computing, coupled with consumerisation of mobile devices, have further enriched the ecosystem. Box 5.1 highlights some significant global and regional trends.

In this chapter:

Chapter 5

Box 5.1. Some significant global and regional ICT trends

Almost 40 per cent of the world's population are online by the end of 2013; but in Africa, only 16 per cent of people are using the Internet.[2] Mobile phone subscriptions exceeded 6 billion in October 2012 and the number is approaching global population (7 billion), with more than half in the Asia-Pacific region (3.5 billion out of 6.8 billion total global subscriptions).[3] In fact, more people have mobile phones than have access to flush toilets and electricity.

Smartphones[4] outsold feature phones[5] for the first time ever in the first quarter of 2013,[6] with Asia as the fastest growing market with 74.1 per cent growth.[7] Rising global demand is expected to drive lower cost of smartphone chips. There are more than 2 billion mobile broadband subscriptions by the end of 2013 with a growth rate of 40 per cent per annum. In Europe, there is 68 per cent penetration but there is only 11 per cent penetration in Africa;[8] the contrary fact is that mobile broadband is more costly in developing countries. Nearly one in four people worldwide will use social networks in 2013. By 2017, the global social network audience will total more than 2.5 billion.

Source: http://www.itu.int

There are, however, also increasing expectations from citizens for easier access to more public information and government services from anywhere, anytime through different channels. The public sector is under pressure to transform itself to respond to changes and radically explore new ways to meet citizen demands. Furthermore, constrained resources in many countries over the past few years have led to a reduction in budgets available for maintaining and developing online services. This has in turn mandated a more streamlined approach focussing on results and impact to providing public services in many countries.

This chapter draws findings of the 2014 *Survey* to explore the global and regional trends of various channels or citizen touch-points of public service delivery. The 2014 Survey questionnaire includes a set of questions to assess the different channels of service delivery in Member States. All sources of data used in this chapter come from this questionnaire, unless otherwise stated. It then presents a multichannel approach as witnessed by practical implementations of multichannel service delivery among leading countries. It concludes with a few key findings and recommendations for consideration by policymakers in embarking on an inclusive multichannel e-government strategy planning, implementation, monitoring and evaluation.

5.2. Global trends of the delivery landscape

Multichannel service delivery is the provision of public services through various means in an integrated and coordinated way.[9] Channels extend from traditional citizen touch-points like counter and voice services, to online means like Internet access through personal computers (PCs), mobile phones and tablets and to emerging media like mobile apps and social media. Table 5.1 shows a non-exhaustive list of channels used in public service delivery.

A channel can change a user's perception and confidence of a public service. For instance, in the context of value proposition of a public service, a channel can add value with a positive user experience, and in the same vein, it can subtract value through a negative user experience. Therefore, it is extremely important to select the right channel for the right service targeting the specific audience. At the same time, channel selection is a deciding factor to effectively reach out to specific groups of citizens, for example, rural population with limited ICT access.

Table 5.1. List of channels (non-exhaustive)

1.	Counter (face-to-face) service
2.	Telephone (voice) service and call centres
3.	Web portal
4.	Email
5.	SMS and other messaging services
6.	Mobile portal (mobile website)
7.	Mobile app
8.	Social media
9.	Public kiosks
10.	Intermediaries through public-private partnership

Digital channels, with both their diversity and spread, are increasingly embraced by almost all countries, while counter (face-to-face service) and telephone (voice) services, have continued to serve as fundamental channels as preferred by some citizen groups. Through strategic and optimised mixed use of channels, governments will be able to provide ubiquitous 24 x 7 access to information and services to different user groups.

5.2.1. Web portal

The 2014 *Survey* concludes that all 193 United Nations Member States have some form of online presence, as compared to 18 countries with no online presence in 2003 and 3 countries in 2012 (see Figure 2.1 in Chapter 2).

Research shows that offering more online services and aiming for increased usage of these services improves efficiency and results in cost reduction. According to one research study,[10] the Government of the United Kingdom could save between GBP 3.30 and GBP 12 per transaction by moving public services online. Denmark has made mandatory the use of online public services in its e-government strategy and action plan covering the period 2011–2015.[11] When fully implemented, it will go "digital by default" for citizens and businesses with the aim of making public service delivery more cost-efficient. Similarly, the Government Digital Strategy[12] of the United Kingdom published in November 2012, stresses that all services should be "digital by default". The strategy states 11 principles and 14 actions to shape how central government departments and agencies will embrace digitalization of their services and improve usage by citizens and businesses. The Government of the United Kingdom has since committed to the

redesigning and rebuilding of 25 significant "exemplar" services to make them simpler and faster to use, as an attempt to meet the Digital by Default Standard by April 2014 and be completed by March 2015.

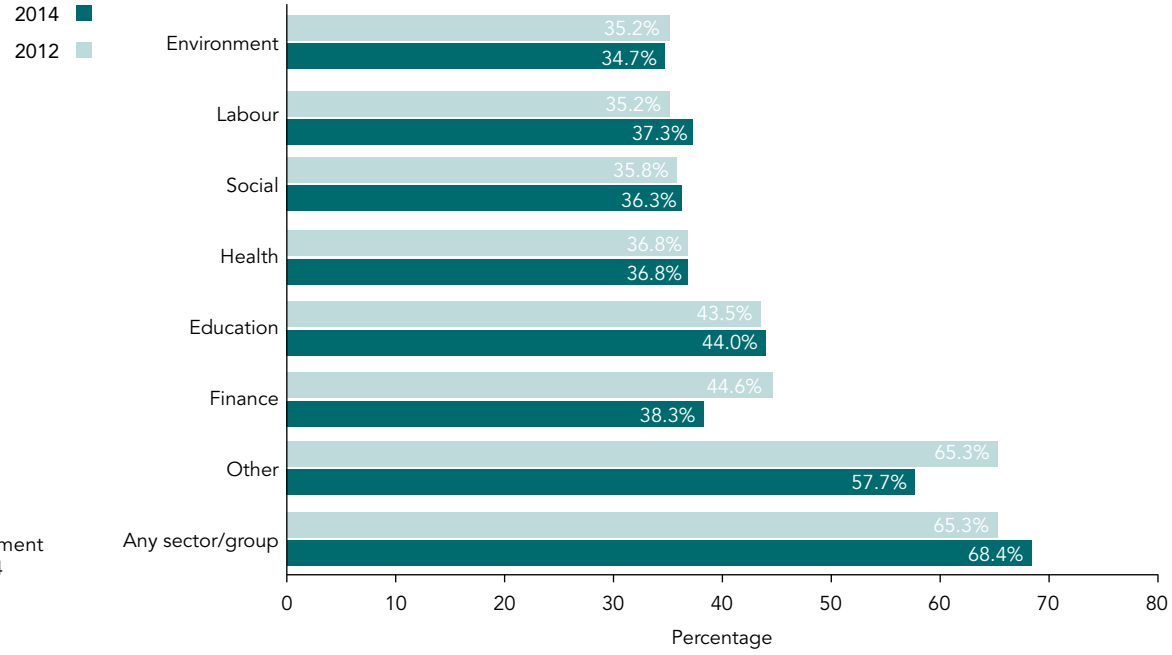
The 2014 *Survey* reveals other trends and insights of e-government web portal development among countries like improving site navigation, extension of features and services offered, to the use of single search interface. (see Chapters 1, 2 and 4).

5.2.2. Email

Email has been a mass channel for routine and ad-hoc communication between governments and their people. Other than information provision, email notification is often integrated to online and mobile services. For example, an incoming email will invoke a workflow action for issuance of a birth certificate copy. Automated emails informing citizens about the status of online applications also build trust and boost user confidence as part of the citizen relationship management process.

The 2014 *Survey* looks at the use of emails in national portals. As can be seen in Figure 5.1, emails remain a fundamental, both complementary and supplementary, channel of the web portal. It is used in all sectors including targeting disadvantaged and vulnerable groups. There is only a slight growth from 65.3 per cent (126 countries) in 2012 to 68.4 per cent (132 countries) in 2014. If the trend of past and current Surveys were to follow, it is expected that there will be increased usage of the email channel for notification and information provision. A simple email link to government officials, at any level, may exponentially increase the ability of people to interact with government online; at the same time, it may also potentially increase the workload of government officials and therefore, unnecessary costs may be incurred if not managed effectively.

Figure 5.1. Percentage of countries providing updates via email or feeds

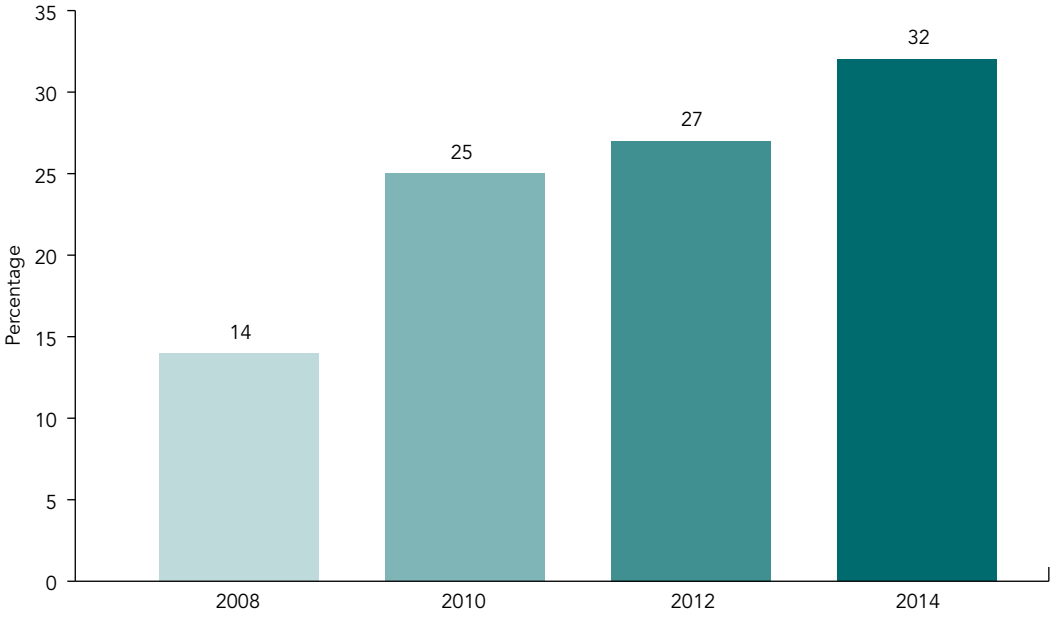


Source: UN E-Government Surveys 2012 and 2014

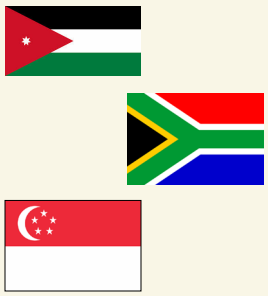
5.2.3. SMS text service

SMS stands for Short Messaging Service—a service that enables users to send text messages to other users through mobile networks. With the proliferation of mobile phones in all regions around the world, countries that have embraced SMS text channel are, surprisingly few and far between. Figure 5.2 illustrates that the number of countries utilizing SMS text service increases slightly from 27 in 2012 to 32 in 2014. More than 80 per cent of the countries have not taken up this mass channel for public service delivery.

Figure 5.2. Slight growth of the SMS text channel from 2008 to 2014



Box 5.2. Innovative applications of SMS service in Jordan



In recent years, governments have deployed various innovative applications of SMS text service. The local Government of Amman, the capital of Jordan, has launched an SMS services portal[13] aimed at increasing the channels of communications between citizens and governments. It is now recognised as the most prevalent communication tool with all segments of the Jordanian community, helping in enhancing the quality and efficiency of governmental services. It provides citizens with two types of services: (i) push messages by governmental institutions and departments such as reminders and awareness campaigns; and (ii) pull messages that are sent by citizens as an SMS inquiry and are automatically responded to by the relevant governmental department. In South Africa, citizens are updated on the progress of application of identity books and identity documents through SMS service.[14] In addressing social inclusion, the Singapore government launched an SMS text service (SMS70999[15]) for members of the deaf, hard-of-hearing and speech-impaired community to reach emergency services.

Box 5.3. Life-saving SMS service in Sweden

The Swedish Government has implemented a country-wide programme called SMSlivräddare, or SMSLifesaver, where citizen volunteers can enrol to receive an SMS text when there is a heart attack victim nearby, allowing trained citizens to reach the victim and provide cardiopulmonary resuscitation (CPR). Upon receiving an alert through an emergency hotline, the call centre will send SMSlifesavers within a quarter mile (500 meters) vicinity a text message with an address and map. Cardiac arrest victims are able to get quickest help possible through this automatic SMS service and it has proven to save more lives as compared to sole reliance of the ambulance service. The average response time of ambulance is eight minutes whereas SMS-livräddare-volunteers have proven to respond quicker and reach victims before ambulances in 54 per cent of cases. Stockholm County has seen a rise in survival rates after cardiac arrest from 3 per cent to nearly 11 per cent, over the last decade.

Source: SMSlivräddare http://www.smslivraddare.se/; QUARTZ (www.qz.com)

5.2.4. Mobile portal and mobile app

A recent research report[16] shows that there are 1.5 billion smartphones users in the world or about 21 per cent penetration rate of all mobile users in 2013 and the number is increasing exponentially in many countries. In Kenya, it is reported[17] that 99 per cent of Internet users access it through the mobile channel. Based on these facts, in their e-government strategy, policymakers should consider: (i) deploying SMS services for immediate outreach to mobile users with feature phones; and (ii) planning for mobile web and mobile apps for the next wave of mobile users with smartphones and tablets.

While there is still a general concern of affordability of smartphones in developing countries, cheaper components and reference operating system designs from chipmakers are pushing for cheaper smartphones. In India, the price of a low-end Android mobile phone had halved in 2012 to about US $50 and prices are expected to drop further. Increased affordability and mass market trends will drive more ownership of smartphones and tablets. Governments must strategically plan for the effective utilisation of the mobile channel.

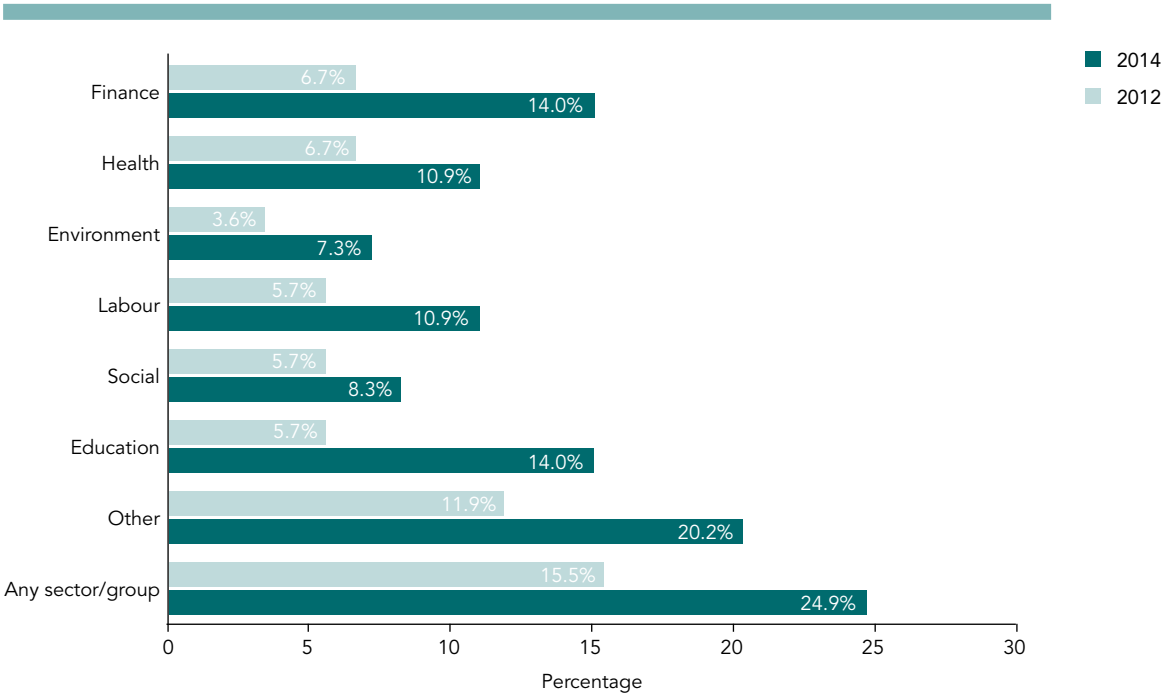
As we have witnessed in verticals such as retail, hospitality, entertainment and travel, the mobile channel is essentially a communication and marketing strategy that augments other channels. At the same time, it is a pervasive one that is in close proximity to its users and it is action-oriented, meaning that one uses the mobile phone to "do something". The same applies to e-government. In addition, as compared to other channels, the mobile channel offers greater service effectiveness through targeting and reach, adding "where, when and who I am" to government services and essentially delivering a high level of personalisation.

The use of the mobile channel in e-government is also referred as mobile government or m-government. It should not be viewed as a replacement or a mere progressive stage of e-government. In most cases of mobile government implementation, the back office still runs through the spectrum of e-government

infrastructure for interoperability and cost effectiveness. Even though the front-ends of the mobile channel takes on different forms and functions, policymakers should not consider m-government as separate or additional means, but rather, as an integral component of e-government.

Figure 5.3 shows that the number of countries offering mobile apps and mobile portal has doubled from 2012 to 2014. For instance, 27 countries (14 per cent) offer mobile services in the education sector in 2014 as compared to 11 countries (5.7 per cent) in 2012 and 14 countries (7.3 per cent) offer mobile services in the environmental sector in 2014 as compared to seven countries (3.6 per cent) in 2012. The offering of mobile portal and mobile websites follows the same trend as seen in Figure 5.4. The number of countries with a mobile portal increased from 25 in 2012 to 48 in 2014. However, this trend is far from its potential and possible saturation particularly in bridging the digital divide of the disadvantaged and vulnerable groups.

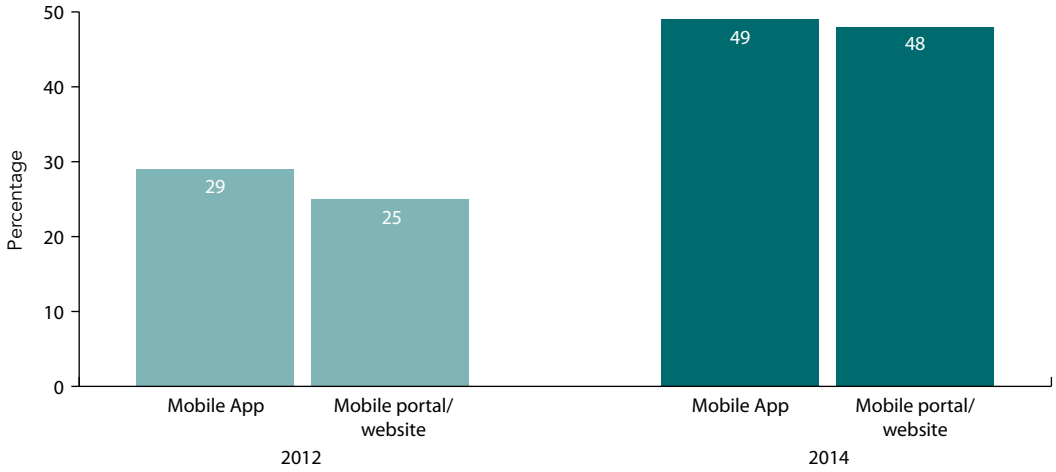
Figure 5.3. Percentage of countries offering mobile government services in 2012 and 2014



Among other unique features, mobile apps are context-aware and location-aware services. Whether it is searching for government information or taking part in e-participation initiatives, as evidence shows, the services that citizens will keep using are those that cut through the increasing confusion and clutter of public information like those available in some scattered government websites. With technologies like capacitive multi-touch screens that have changed the very nature of human-computer interaction, many e-government development pipelines from both developed and developing countries have embraced the growing role that mobile is playing in people's everyday lives and the potential of m-government to meet citizen needs to deliver information and services any-

where, anytime and on any device. Some countries have clearly recognised the enormous potential of mobile government. In the United States of America, the Obama administration ordered all federal agencies to begin making at least two apps as part of its recently unveiled digital government plan, in which it called for "a 21st century platform to better serve the American people."

Figure 5.4. National portals offering mobile apps versus mobile portal/websites in 2012 and 2014



Box 5.4. Mobile government for poverty eradication and economic growth

Mobile payment is an increasing trend particularly in developing countries. M-Pesa is one striking example of mobile money service in Africa that boosts employment and fights poverty. Started in Kenya, it allows users to make deposits and withdrawals, transfer funds and pay bills, offering flexible financial services in countries where banks and road infrastructure are still developing and yet meeting financial rules and regulations. The rise of mobile payment is expected with much of the continent's population living in rural areas, with little access to ICT infrastructure. With both sender and receiver owning or having access to a mobile phone, banking services are extended to all including disadvantaged and vulnerable groups. M-PESA has since expanded to include mobile airtime top-up, salary payments, interest-earning savings account and international money transfer. Mobile payment and mobile wallets will continue to gain traction in the next few years with technologies maturing and greater user confidence and acceptance.

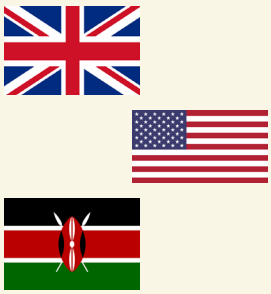
Source: http://www.safaricom.co.ke/

Further recognizing that the transition to a mobile-led service delivery landscape is the future strategy, policymakers will need to consider and plan for strategic changes in governments' business models and that this requires significant rethinking of the workflows in order to capitalise on reshaping e-government to deliver sustainable development objectives. It is noteworthy that in many coun-

tries, several public sector related mobile applications are developed on the basis of open government data, among other data sources (see Chapter 8).

We are in the process of an explosion of mobile adoption but at the early stages of mobile government, particularly in developing countries and the least developed countries. However mobile is the new business as usual and e-government needs to go mobile.

Box 5.5. Mobile government for gender equality and social inclusion



There is growing evidence that women's use of Internet and mobile phones has a powerful impact on sustainable development, from connecting to healthcare, to tele-working and securing income for family with e-banking. Those countries that have adopted a multichannel approach to service delivery will open options for greater gender equity and closing the gender divide. This is one area that has seen the largest gaps and also the highest potential of achieving development objective through e-government initiatives.

The United Kingdom's FixMyStreet and SeeClickFix of the United States of America, both are successful examples of a map-based citizen reporting platform that enables the public to report and track non-emergency related issues, via both web and mobile. Ushahidi, which means "testimony" in Swahili language, was first developed to map reports of violence in Kenya after the post-election fallout in 2008. The site, which now functions as a citizen reporting platform, has grown to become an important resource for citizen journalists in time of crisis like the Haiti earthquake and the Queensland (Australia) floods. The Ushahidi platform provides tools for communities to crowdsource real-time information like using web, email, social media and SMS text service.

Source: http://www.fixmystreet.com/; https://en.seeclickfix.com/; http://www.ushahidi.com/products/ushahidi-platform

Box 5.6. Mobile government for environmental protection and disaster management

Mobile government is also increasingly deployed in environmental protection and disaster management system, where government plays the critical coordination role.

The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), in the report of the Committee on Information and Communications Technology, reiterated the importance on the use of ICTs and mobile technology for disaster risk reduction. Bangladesh through its Disaster Management Bureau (DMB) is developing an SMS-based disaster warning system. The Japanese Government is leveraging on mobile technology to deliver emergency information such as evacuation instructions from local governments and reports from the current disaster system.

Source: UN ESCAP Committee on Information and Communications Technology, 2010 (E/ESCAP/CICT(2)/L.2), Information and Communication Technology–Enabled Disaster Risk Reduction in Asia and the Pacific

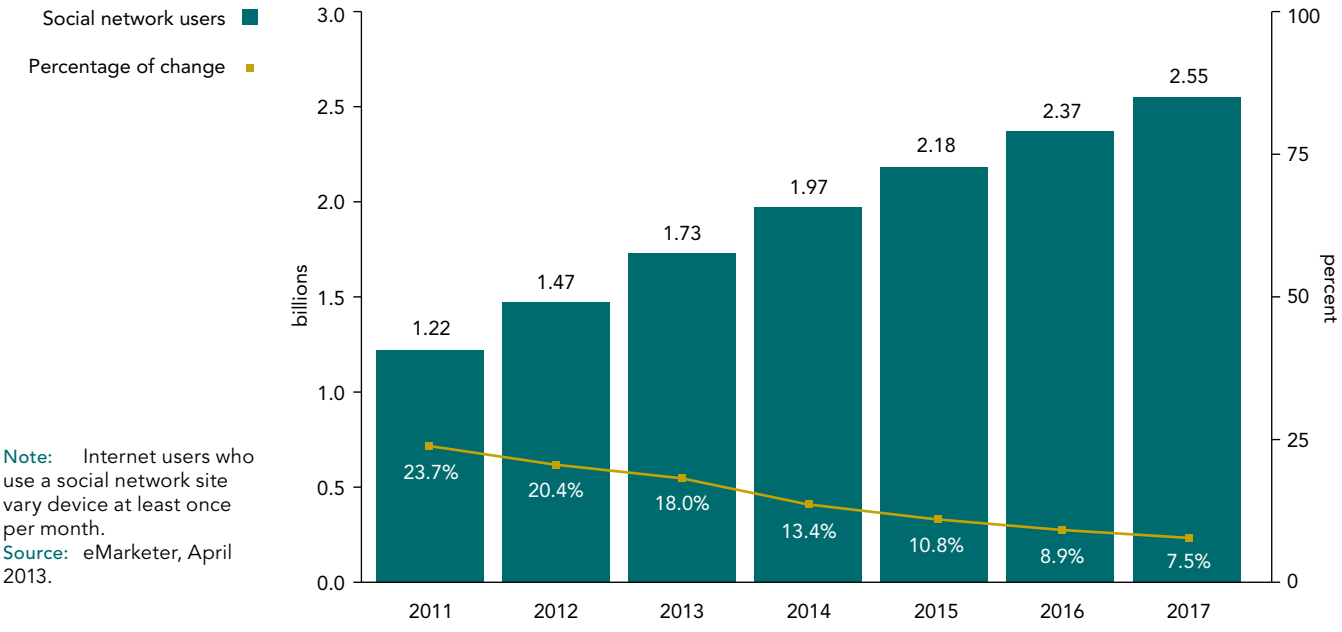
5.2.5. Social media

One research study[18] predicts that by the end of 2013 more than 90 per cent of Fortune 500 companies will have partially or fully implemented an Enterprise Social Network. There is little reason why the public sector should not embrace this compelling trend in its service delivery.

The social media channel, which can be accessed through both desktop online and mobile devices, should certainly be explored further for public sector and communities to reach out to all their constituents particularly disadvantaged and vulnerable groups. Compared to other channels, it may be deemed a more cost effective channel.

Social media channel implementation does not require high investment costs as it typically rides on consumerisation and non-governmental platforms. Figure 5.5 shows the projected growth of social media through 2017 and Table 5.2 lists the social platforms used globally and in selected countries.

Figure 5.5. Social media users worldwide (2011–2017)



Note: Internet users who use a social network site vary device at least once per month.
Source: eMarketer, April 2013.

In order to realise the full potential of the social media channel in e-government, a business transformation is necessary. Maintaining a Facebook page or Twitter account is relatively straightforward and easy, but will not in itself generate significant public value, cost reduction or increase in citizen trust. For example, e-participation through social media channel needs to be socially re-engineered, taking advantage of the real-time social networking attributes with human interaction and commitment of public servants including those at the senior levels, in order to fully and actively engage citizens in e-information, e-consultation and e-decision-making (see Chapter 3).

Table 5.2. List of social media channels (order by general popularity)

Facebook | Google+ | Youtube | Twitter | LinkedIn | Myspace | Pinterest| Tumblr (Global)
Qzone | Sina Weibo | Tencent | Youku | Tudou | RenRen (China only)
Vkontakte | Odnoklassniki (Russian Federation only)
Sonico (South American countries only)
Mig33 (Indonesia only)
Tuenti (Spain only)
Nate Connect | me2Day (Republic of Korea only)
Mxit (South Africa only)
Copains d'Avant (France only)
mixi (Japan only)
Hyves (Netherlands only)
studiVZ | meinVZ (Germany only)

Figure 5.6 shows that the number of countries using social media has more than tripled from 2010 to 2012 and increased by another 50 per cent in 2014. Following the same trend, as illustrated in Figure 5.7, 71 countries have explored the use of social media in e-consultation, indicating a 400 per cent increase as compared to 14 countries in 2012. These two significant trends are set to continue in the next few years. The challenge for governments is to identify the right "business case" for implementing a social media channel, one with a convincing argument and implementation plan that will enable governments to reduce cost or to provide a better service, or to deliver both of these aspects at the same time.

Box 5.7. Lungisa ("fix it"): Fixing service delivery problems using social media (Cape Town, South Africa)

Citizens in the Cape Town region of South Africa can report delivery problems with water, electricity and other public services, using the reporting platform called Lungisa (meaning "fix it" in isiXhosa). The problems will be reported to the appropriate authorities and resolved via SMS, USSD, Mxit, Web and Facebook.

Over 1,500 reports using Lungisa have been filed and over 1,100 cases resolved (as of October 2013). Its partnership and collaboration with the City of Cape Town is reported as critical, and almost half of the reports have been resolved, largely by the City Council with the help of the Lungisa team follow-up monitoring actions.

Source: http://www.lungisa.org/

Figure 5.6. Number of countries using social media for e-consultation

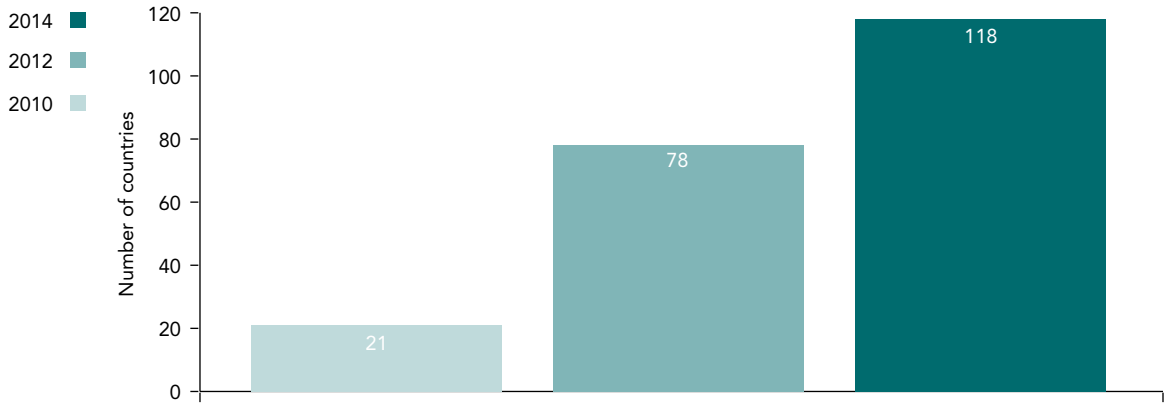


Figure 5.7. Number of countries using social media for e-government

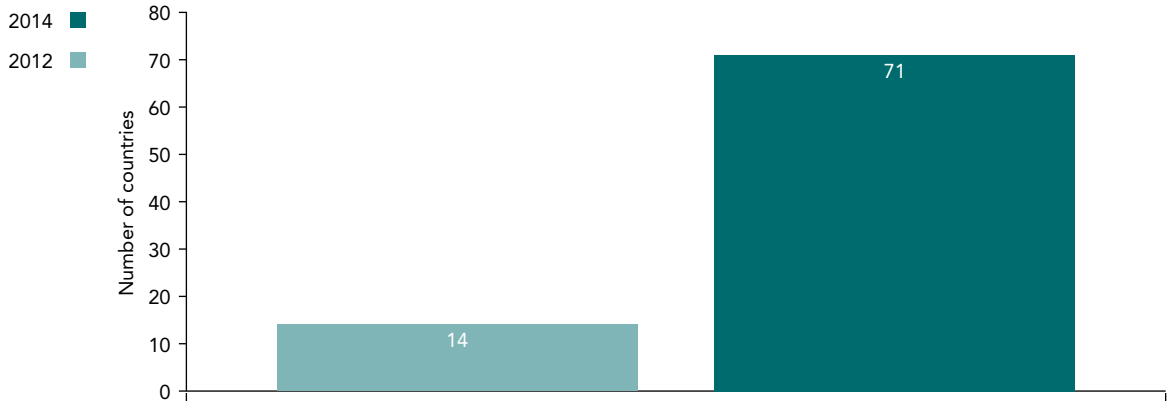
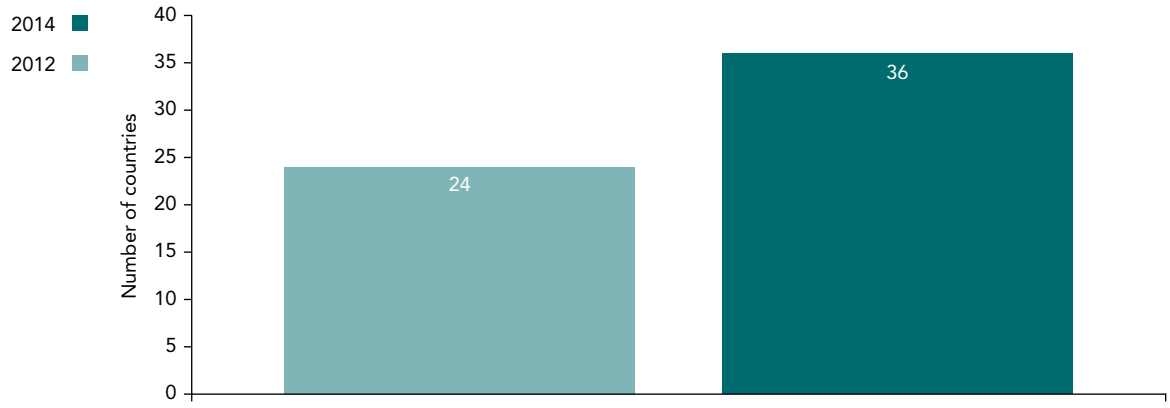


Figure 5.8. Number of countries using public kiosks



5.2.6. Intermediaries such as public kiosks

The 2014 *Survey* assesses whether government portals promote the use of public kiosks for their e-government services including those found in community centres, post offices and public libraries. There is an increase of the use of public kiosks from 24 countries (12.4 per cent) in 2012 to 36 countries (18.7 per cent) in 2014, as seen in Figure 5.8.

Public kiosks are public-access facilities providing free access to online services especially in marginalised or remote areas where ICTs are not prevalent. Funded by governments or supported through public-private partnerships (see following section), they normally serve several concurrent functions, including enabling communities and citizens to access new knowledge and information that can be incorporated into local knowledge and context, such as, among others, provision of information on employment opportunities, educational resources, agricultural information like planting techniques and disease prevention and other government information and services. Public kiosks also provide the means for intermediaries to assist citizens in accessing public information and services.

For increased social inclusion, the Singapore Government has set up CitizenConnect[19] Centres in all residential estates to assist citizens, particularly older persons and the illiterate to: (i) assist them to use government transactions online; (ii) help find information from government websites and (iii) contact government agencies on their behalf.

5.2.7. Intermediaries through public-private partnerships

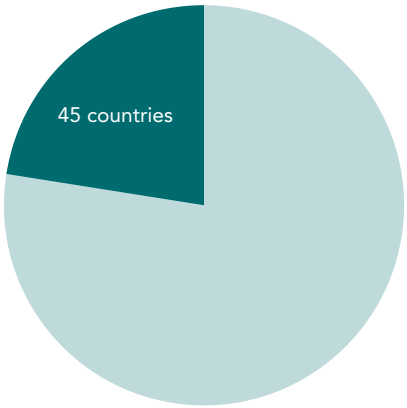
E-government and ICT projects are natural candidates for public-private partnerships.[20] Not only is there the potential for the private sector to finance the capital investment, thereby, freeing up public sector resources for other projects that have higher social returns, the private sector will also be able to lend its high expertise and operate the project possibly in a manner more efficient than the government itself.

Through public-private partnerships and crowdsourcing, the government can also reach out to a wider group of citizens including disadvantaged and vulnerable groups, such as those located in rural areas. According to the 2014 *Survey*, 45 deployed e-services through or in partnership with third parties such as civil society or the private sector including any Public-Private Partnership (PPP), as shown in Figure 5.9.

The Philippines Government has set up an online portal on public-private partnership[21] to attract private partners to invest not only in traditional infrastructure projects, such as power, transportation and water sectors, but also in non-traditional infrastructure and development sectors, such as ICTs and e-government itself.

Open government data and open standards have also changed the public delivery landscape, offering more opportunities for governments to collaborate with civil society and citizens for co-creation with the private sector or self-developed public service initiated by concerned citizens. Box 5.7 is one example on how the United States of America is embracing this channel.

Figure 5.9. Number of countries with PPP e-service



Box 5.8. United States: promoting self-developed applications through open government and application interfaces (API)

One way that the United States is embracing mobile is through the release of hundreds of application interfaces (APIs) that can be used by private-sector developers to create new applications and services.

These APIs encompass government datasets such as home and business energy trends, real-time earthquake notifications around the world and the current weather on Mars transmitted from the Curiosity Rover. To facilitate the creation of new apps, each government agency has released its own developer pages and Data.gov launched a government-wide API directory so these resources are easier to find and use. These moves were further supported by President Obama's recent executive order and open data policy making open and machine-readable the new default for government data. The federal government also created the Mobile Application Development Program to help agencies launch mobile apps.[22]

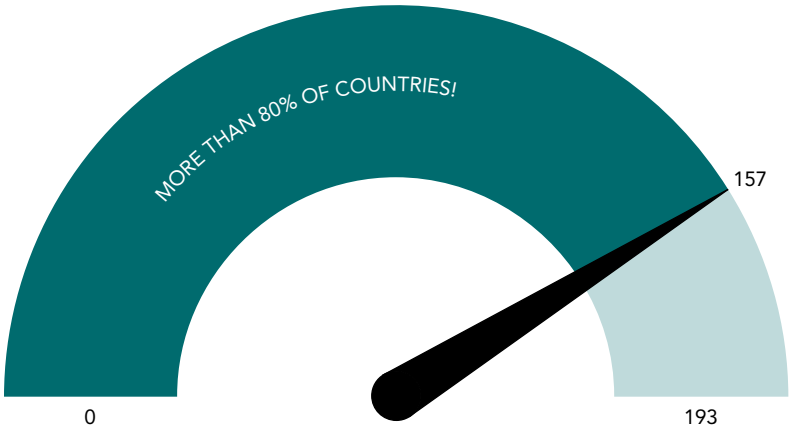
5.2.8. Counter and telephone services

In addition to emerging digital channels, counter (in-person), paper-based and phone (voice) services will remain as fundamental channels. Individuals who are not comfortable with new technologies may prefer to speak to someone in person or over the phone to resolve an issue while certain public services, such as issuance of birth and marriage certificates, still warrant some form of personal interaction for identity authentication and authorisation among other reasons.

Research in China shows that digital and traditional channels supplement each other, particularly among disadvantaged and vulnerable populations in rural areas.[23] Therefore, governments must provide multiple channels for different constituents, at times allowing them a choice of service access online, over the counter, over the phone, at a kiosk, or via mobile phone. Figure 5.10 shows that more than 80 per cent of countries (157 out of 193 United Nations Member States) indicate the full address of at least one government agency in its web portal, indicating the general acknowledgement of governments about the importance of maintaining

counter and paper-based channels. Similarly, voice has remained a fundamental channel of e-government services, especially among the poorest and low-income countries. One study shows that the phone remains an effective channel for solving problems whereas websites are more effective for getting information.[24]

Figure 5.10. Number of countries showing full address of any government agency in its web portal, 2014



In Sri Lanka, through the 1919 Government Information Centre (GIC),[25] one could dial 1919 from any phone to access all services offered by the government. In many communities and states in Canada and the United States of America, a non-emergency telephone number 311 is a central, all-purpose phone number that provides quick and non-emergency services. The City of New York 311 Customer Service Centre of the United States was recognised and awarded the United Nations Public Service Award[26] in 2012. Several European countries such as Finland, Germany and Sweden have offered similar non-emergency phone service. One drawback is the high cost of maintaining a call centre and this is the main consideration when looking to replicate this service in developing countries.

5.3. Building an inclusive multichannel e-government strategy

Multichannel service delivery mechanisms

When delivering public service solutions and services, governments must consider an optimal mix of channels to interact with and conduct business with citizens. Access issues, cultural and social norms, as well as government resources and approaches will play a part in this progression.

It is reported that half of the citizens (46 per cent) in the European Union go online to look for a job, file a tax return, register for a passport or use other e-government services.[27] This promising trend will deliver its expected results and impact provided if current users continue to trust and use online services and at the same time, access is provided

to a wider group of citizens. Therefore there is a need to embrace an inclusive multichannel approach as part of the national e-government strategy to ensure increased usage and citizen satisfaction while exercising caution to consider the possibility of increased cost and burden on existing resources (see Chapter 7).

5.3.1. Service principles of a multichannel approach

With multiple factors and choices, what are the service principles of a successful multichannel e-government strategy? Following is a list of selected questions that one should consider before setting metrics for a multichannel approach:

- Are the vision, mission and goals of a multi-channel approach well deliberated and clearly defined? What are the agreed performance indicators?
- What are the perceivable impacts of each channel option? Consideration should not only be given to achieving the aim of government for effective service delivery but also to meeting the needs and expectation of users. Accomplishments of desired key performance indicators will typically result in higher sustainability of the channel option in the longer term.
- Who is the target audience? What are the ICT characteristics of each channel option? Making a good match between these two elements is critical; it is essentially balancing what the technology does well, that is, managing a plethora of data in the most efficient way, with what people do well, that includes judgement, empathy, social context, etc.
- How can the diversity of channels be best managed to balance flexibility and control in a fast-changing and increasingly complex delivery landscape and meeting citizen needs?
- Should there be a smooth and robust transition of multichannel implementation, or should one undertake a strategic risk to leapfrog to the cutting edge?
- Should one mobile-enable all online services including "matured" ones like paying of taxes which is already prevalent in some countries?
- How should social media channel be integrated to the web and mobile channel? To what extent should government trust external social media platforms to take security and privacy issues into consideration?
- Should government leaders "mobile-enable" front-line public servants so that they could better address the needs of citizens? One approach is the embracing of BYOD (Bring your own device) for public servants but this measure entails complexities in consideration of the public servant capacity in addition to security and regulatory compliance concerns.
- What are the infrastructure frameworks and service standards? Is there a need for enterprise architecture if non-existent? Is there a role of an interoperability framework?

Among other things, one myth is that in today's information age, governments have to be at the forefront of deploying the most advanced online services offered through the latest technologies. One should not be misguided based on wrong premises such as the mere availability and possibilities of technologies. For instance, given that more citizens have access to feature phones in some developing countries, instead of considering state-of-the-art smartphone applica-

tions, SMS text service should perhaps be considered as the prime channel for its accessibility and more importantly, addressing the needs of the citizens. Tapping through a multichannel approach to meet sustainable development goals is not only an issue of understanding technologies; it is an issue of understanding the citizens, their concerns and needs.

For developing countries with little or no legacy in infrastructure or online processes, there is a potential to leapfrog by using available resources more effectively. Governments should develop services to leverage the benefits of the burgeoning wireless infrastructure including mobile broadband that is being deployed particularly in developing countries. Finally, the aim of a multichannel approach is not to utilise all channels but rather to optimise selected channels for specific service to deliver the best results and to achieve social equity by reaching out to all the population groups, including disadvantaged and vulnerable ones.

Table 5.3. Service principles of a multichannel approach

1.	A multichannel approach is a nexus of strategy, workflow, data and technology;
2.	One ultimate goal is to leave no citizens behind to achieve social equity;
3.	Map channels to citizen needs, service functions, value propositions and available technologies;
4.	Innovate and evolve for best results and citizen satisfaction; no silver bullet exists and due diligence needs to be in place for effective service delivery.

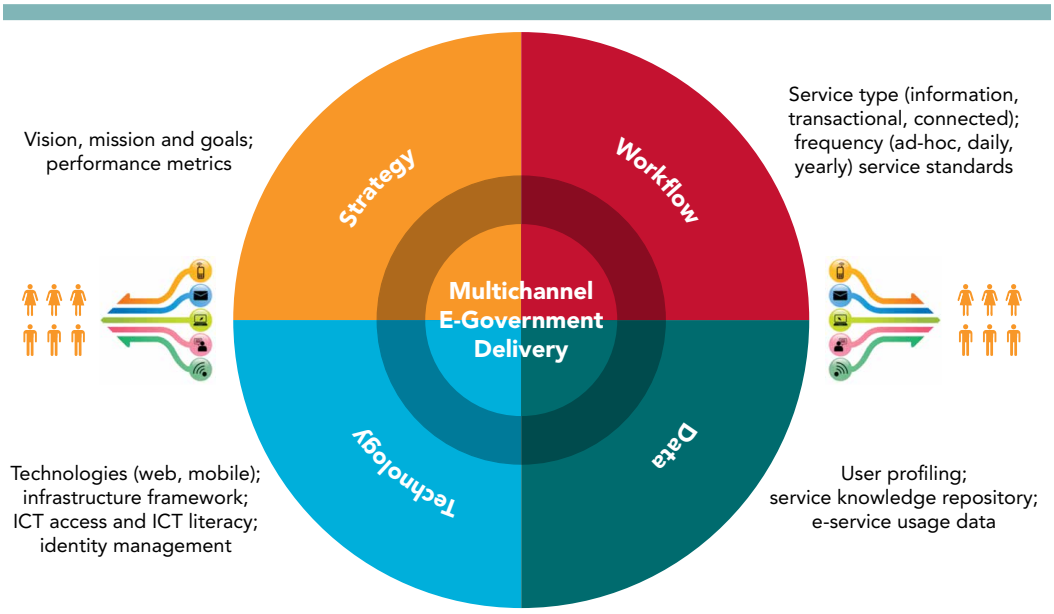
5.3.2. Integration and optimization of channels

Taking into consideration the converging delivery landscape, there is no longer a clear distinction between traditional and new channels. For instance, even though all 193 United Nations Member States have some form of online presence according to the 2014 *Survey*, in order to reach out to a wide group of citizens, particularly those with access to mobile phones, there is now a need for national portals to focus on optimizing government websites for mobile devices (see Table 5.3 for service principles of a multichannel approach).

As e-government matures in each stage of its development, one important measure is for policymakers to select the right channel and service mix as part of a multichannel roadmap of their e-government strategy. Based on the 2014 *Survey*, as demonstrated by various national portals, different channels are selected for each maturity stage of the United Nations e-government model first adopted in 2003.[28]

While many countries face challenges in progressing to the third stage—transactional and the fourth stage—connected, it is important to recall that the first and emerging stage still plays a foundation role as information providing and sharing remains at the top priority need of citizens. This is best supported by a multichannel service approach. For instance, dissemination of public alerts can be done in a short period with reliability, such as through SMS text services and email messages, and many countries have put in place such a system as part of their disaster management and response system. Providing information through various channels will also result in citizens' trust of governments, thereby boosting the accountability and transparency of the public service.

Figure 5.11. Service principles and framework of multichannel approach to e-government delivery



Box 5.9. Channel integration and channel optimization

1) Channel integration in e-government

In the context of e-government, channel integration refers to strategies aimed at consolidating or connecting online services, either physically or logically in the use of specific channels, in order to provide quality services that are both accessible and flexible for the user and in a cost-efficient and effective manner.

2) Channel optimization in e-government

In the context of e-government, channel optimization refers to strategies aimed at taking the full advantage of selected channel(s) to deliver efficiency savings, improved customer experience or both.

The important need of channel integration and optimization can be illustrated through the view that channels are citizen touch-points and these touch-points should play a complementary and/or supplementary role to one another. For instance, during a visit to a government office, the citizen's past interaction with the office including through its online portal should be available as part of the customer relationship management system of the government office. No matter which channel is used Figure 5.13 shows a correlation between channel optimization,[29] online service and income (GNI per capita) of selected countries according to the 2014 *Survey*.

The last edition of the *Survey*[30] observed that countries with high income in general are able to enhance their e-government services through channel optimization. However, one can see through the 2014 *Survey* that some middle-income countries such as Armenia, Colombia, Turkey and Venezuela are also able to demonstrate channel optimization.

Figure 5.12. Channel use for each stage of the UN model of e-government development

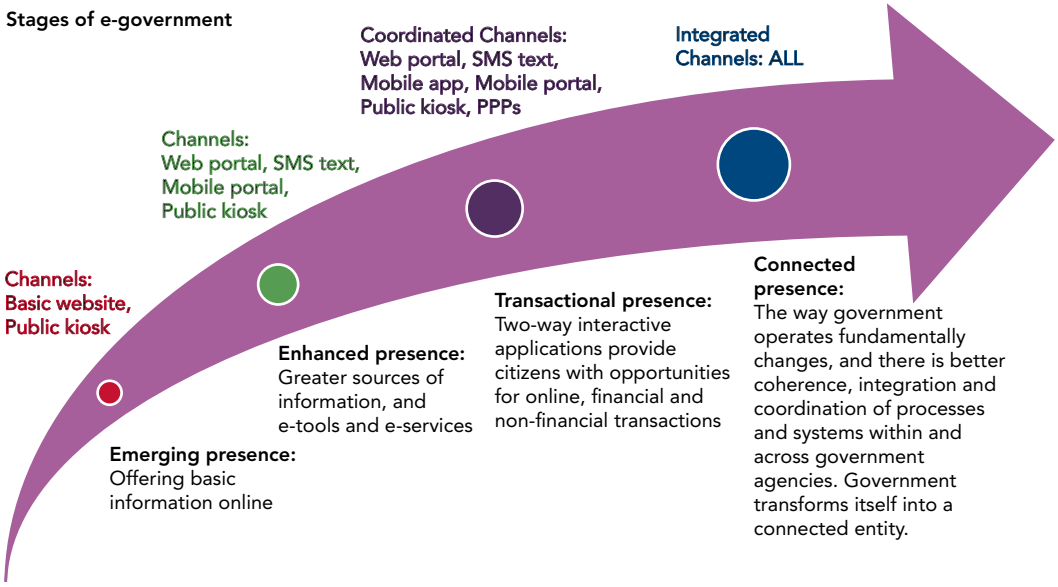


Figure 5.13. Correlation between channel optimization, online service and income (GNI per capita; represented by bubble size) of selected countries

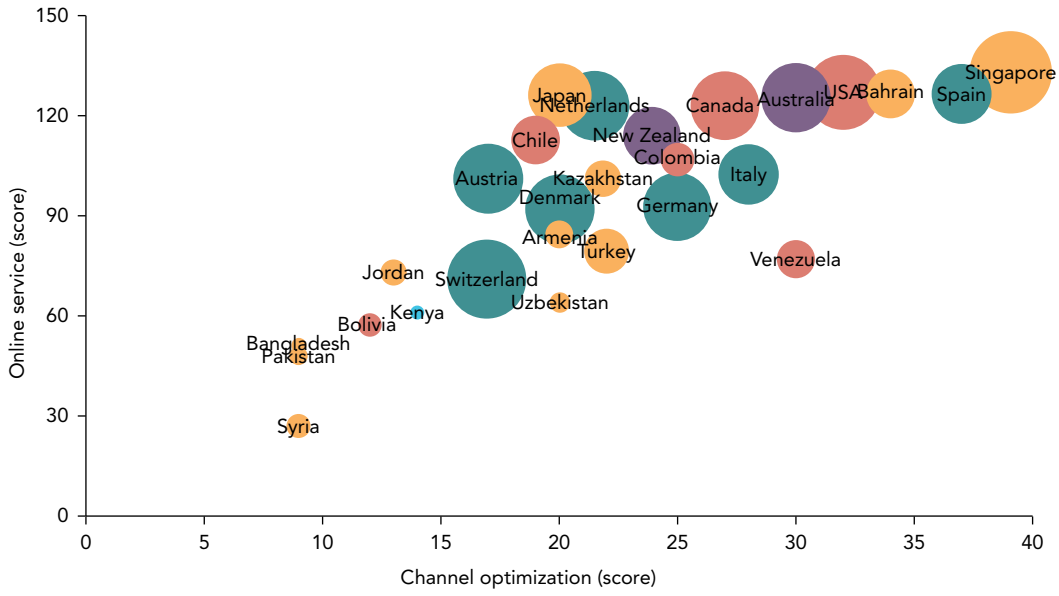
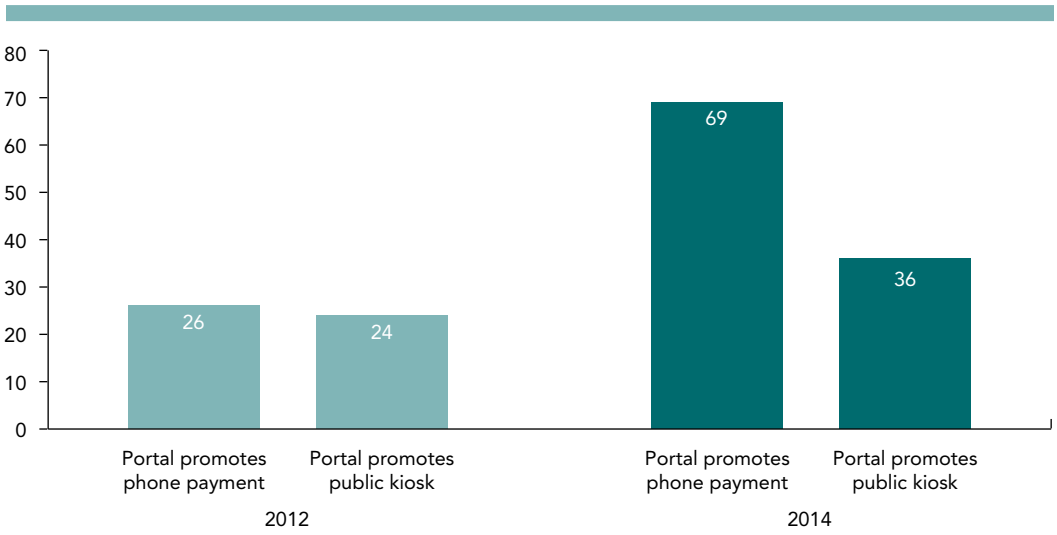


Figure 5.14 illustrates how countries are doing more to integrate channels. In 2012, 24 countries promoted the use of kiosks through their portal but there is an increase of close to 40 per cent with 36 countries in 2014. The number of countries promoting the use of phone payment increased by close to three-fold from 26 in 2012 to 69 in 2014.

A strategic national framework of e-government that encompasses multichannel service delivery is not an option but a natural progression of technological advancement in a society, particularly with the increasing trend of mobile devices.

Countries, including European and other countries like the United States of America, Japan and Republic of Korea, have all benefitted in meeting some economic, social and environmental goals by having an explicit multichannel plan as part of their e-government strategy. A whole-of-government approach in designing e-government strategy is essential in deciding the choice of channels, as there is increasing emphasis on integration and collaboration in public service delivery, as opposed to single-purpose silos in public administration (see Chapter 4).

Figure 5.14. Illustration of integrated channels—web portal promoting phone and public kiosk



5.3.3. Framework of a multichannel approach

Ideally policymakers should envision a longer term beyond one year for their e-government strategy. Some countries have embraced a two-year or three-year plan; however, a five-year plan, as demonstrated by several countries such as China, Denmark and others, may prove to be optimal, with evaluation at the mid-term to make any adjustment. As technologies mature and user base increases, such applications can scale up to achieve more diverse objectives or reach out to a wider audience. The enabling environment and various blocks have to be considered carefully while establishing a multichannel approach.

Setting clear objectives

In general, there are two broad objectives[31] of a multichannel approach. The first focuses on citizens' needs and the second focuses on making service delivery more efficient. As various studies[32] demonstrate, a multichannel approach does not mean that the needs of the citizen are addressed at the expense of the limitations of the service provider, or vice versa. One important consideration is to underpin reliable and cost-effective delivery of e-government service and at the same time maximise the flexibility to meet changing and emerging needs of citizens, including meeting the specific needs of disadvantaged and vulnerable groups. There is a necessity to define policies and standards to span service levels, different sectors and quality expectations.

User profiling and service personalisation

Through citizen demographics and taking stock of citizen needs, a good profiling exercise will unlock insights about service users, their capacities and specific channels to reach out to them. For social inclusion, more efforts should be made to the specific disadvantaged and vulnerable groups. It is recommended to undertake separate user profiling exercise for disadvantaged and vulnerable groups, including: older persons; people living in poverty; the illiterate; youth; immigrants; women; and persons with disabilities. One approach is for governments to do user profiling as a big data[33] initiative. Various data such as citizen demographics, actual usage of existing online services, and disparate data sources such as consumer use of social media, should be factored in the user profiling exercise. In addition to service user profiling, for some countries particularly the European countries, there has long been a trend to move towards service personalisation or customisation at the individual level, with the option for citizens "pulling" services they want via the channel of their preference and thereby "designing" their own unique service portfolio or dashboard, as in the "My Page" examples of Denmark, Netherlands and the United Kingdom.

Implementing and integrating different channels

Governance of channels in itself has to go beyond defining a strategy and provide a strong steer on developing in-house capacities which can support the implemented channels. Embracing the diversity of the service delivery ecosystem, governments may explore cloud sourcing and cloud computing and green ICT for implementation of integrated channel service delivery. A successful implementation should be followed through with effective management and marketing of the channels in order to reach out to the target groups, particularly the vulnerable ones, or to entice citizens into using the most cost efficient channels based on the service type, frequency and complexity of interaction. Refer to Chapter 7 for analysis of different ways to promote the different channels, including through training, promotional events with outreach through mass media, etc.

Monitoring, evaluation and review

As is the case for any project implementation, the monitoring of usage and critical evaluation of results is important for its own sustainability. With proper monitoring and evaluation and leveraging data with key performance indicators, governments can make evidence-based decisions on the change of their e-government strategy or prepare for the next term plan of their e-government strategy. There should be a consideration of e-discovery, for example, that policymakers can be prompted to consider new areas for mobile apps implementation through an automated process initiated by increased usage of mobile websites.

5.4. Challenges and opportunities of the emerging channels

The delivery landscape of public service changes with the technological trends and emerging needs of citizens, both of which are continuously evolving. Over the past few decades, we have witnessed a reduced reliance on channels such as the television and radio, and we are now witnessing changes brought about by disruptive technologies such as mobile devices and social media.

Challenges of a multichannel approach will become increasingly complex and intractable. Some strategic risks are inherent and henceforth their negative impact should be seriously considered when planning and implementing pubic services.

5.4.1. Challenges of the multichannel approach

Maintaining a single consistent citizen view and experience

Although it is evident that a multichannel approach will reach out to more citizens as compared to a single channel approach, the former will also result in loss or fragmented information and misalignment of service standards. In advanced countries, citizens are also expecting that e-government services will be supported for the wide spectrum of multi-screen devices that they own. It is also likely that citizens will request more information through their mobile devices including smartphones and tablets while visiting a government office. Such citizens will be more informed about government services and this would in turn speed up the service request, both online and offline, saving both public resources and citizen's time and effort.

With converging channels and a diverging range of consumer devices, there is an increased blurring of what belongs to one channel and what does not. For instance, users could be assessing websites through mobile but miss out on information and get frustrated if the websites are not optimized for mobile devices. When users move from one channel to another channel, there is an expectation for seamless flow of information between the channels. This in itself is a challenge for data flow within one agency. For services that concern different agencies, this challenge is even more apparent.

This challenge may be overcome through channel synchronization including tapping on common infrastructure such as use of cloud computing, deploying a unified knowledge base and setting service standards to aim for a "single citizen view" such that one will access the same information with consistent standards regardless of channel selection. One approach, as observed through trends in some countries, is the citizen-driven approach where one can have a consistent view of own data that is also controlled and personalised at the individual level, for example through "My Page" or a personal dashboard.

Addressing security and privacy concerns

The increasing use of mobile channels has resulted in the increasing vulnerability of sensitive information. While service providers have to exercise caution in ad-

dressing this concern, there is also a need to educate citizens on how they can reduce this risk, as users may be the primary cause for certain threats. For instance, citizens should adhere to the advice of selecting a good password following best practice and accept two-factor authentication, should that be offered.

Governments must conduct due diligence in ensuring citizen data is protected such as through secured system access, user identification, data protection and other critical security measures. When putting in place such measures, other factors like cost effectiveness, speed-to-market delivery and integration of new channels to legacy systems including through cloud services, should also be considered.

Getting ahead of technologies

Due to the complexities and possible high costs involved for some channel implementation, an overly ambitious implementation of a multichannel approach may lead to failure points such as unused ICT infrastructure and lack of in-house expertise to provide service maintenance or user support. Managing the channels does not equate to managing technologies but it entails more. There is a need to understand the different challenges beyond technologies while understanding and addressing citizen needs.

Evaluating BYOD (Bring your own device)

There needs to be a cross-device approach or a multi-device user context for some services. One approach is the embracing of BYOD (Bring your own device) for public servants, as well as for citizens and businesses, and these entail complexities in the context of the capacity of public servants and other concerns such as security and regulatory compliance. Half of the world's organizations and private companies are expected to embrace BYOD—how public servants can tap on mobile devices, for example, in providing front line services is a challenge for the public sector. There are also some views that BYOD is not ready for mainstream adoption in e-government processes.

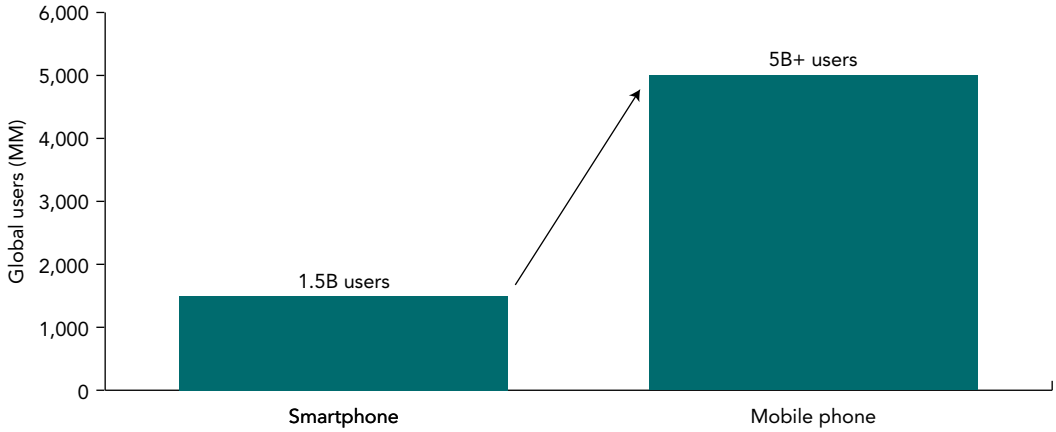
Other challenges

Language diversity is a challenge in many countries and language considerations should be included as part of the user profiling exercise in deciding the most appropriate channels.

5.4.2. Opportunities of the emerging channels

Dissecting the mobile wave, we note that there are two major categories of devices—smartphones and feature phones. There is a high potential for developing and least developed countries to tap on the mobile channel, including SMS text service on feature phones and mobile apps on smartphones, since these countries have been historically limited by poor or non-existent fixed communications infrastructure. Figure 5.15 shows that there is an expected high growth potential of smartphones with the convergence of technologies, with at least three-fold increase of the smartphone users over the next few years.

Figure 5.15. Global smartphone versus mobile phone users in 2013



Source: Morgan Stanley Research estimates.

The utilisation of the mobile channel, including through tapping the SMS capability on feature phone, is far from saturation. Even in developed countries, where the mobile market is close to saturation, the adoption of mobile government is relatively low. Likewise, successful adaptive applications of mobile government remain limited. As illustrated in Figure 5.16, in 2008, there was higher use of SMS text but in 2012, there were more countries using mobile apps and portals as compared to SMS text and the trend continues in 2014. As observed through the 2014 *Survey*, there are 49 countries offering mobile app/websites whilst 32 countries offering the SMS text service. Through the estimated figures, we expect a continued growth of the number of countries offering SMS text service, mobile app and mobile website as part of their e-government offerings. The mobile channel is relatively more cost effective and it is also flexible and personalisable for both "pull" and "push" services, stimulating the innovation of many new business models which especially people living in poverty, the self-employed and small-medium enterprises can benefit from.

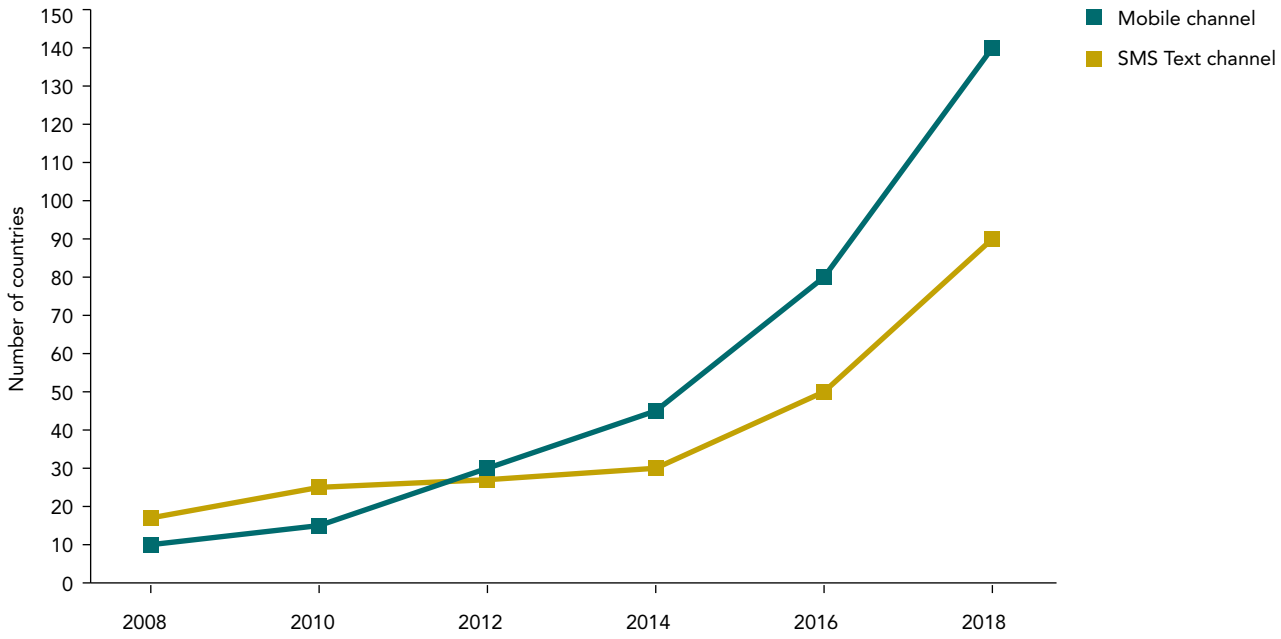
Some governments have driven a policy direction with high priority for the mobile channel. In June 2013, the Government of the United Arab Emirates decided to change the name of their e-government initiative to Mobile Government (m-government), signalling the government's priority on the delivery of government service to the public through their mobile phones, anywhere and round-the-clock.[34]

M-Government will also offer countries the opportunity to tackle a number of issues—such as those related to the digital divide—which remain a critical factor in the take-up of online services.[35] Mobile is driving change and the impact of mobile government will be ground-breaking in the next few years.

5.4.3. Hybrid and integrated channels

When two or more channels are involved in a single service provision, a hybrid channel is evolved. Tight integration is a necessity to ensure seamless user experience. Some examples of hybrid channels are as follows.

Figure 5.16. Countries[36] offering SMS text and mobile web/app services



Integration of voice to web channels

It is understandable that some citizens prefer to speak to a person for a specific or any service. This is particularly the case for some disadvantaged and vulnerable groups such as older persons and the illiterate. One new approach is the introduction of integrated "online live chat" or "virtual assistant" to online services so that users can be assisted in a more personalised manner. One example is the portal of the Mexican state of Guanajuato, where virtual assistants are presented as a cartoonlike character to answer custom questions asked in a written or even oral form.

At the same time, service delivery may be extended from voice to web channels, for example, by referring citizens who call public hotlines to access web information about public healthcare or to a mobile application for public housing. Effective management of service across traditional and digital channels is essential to a good citizen experience.

Gamification

Gamificaton[37] is relatively new but it has the potential to engage youth in public affairs particularly through sustainable development objectives. One good example is the application "OPower"[38] that has seen success in countries including France, Canada, Australia and New Zealand, United Kingdom and the United States of America. It encourages people to become more responsible about their energy consumption by utilizing gamification to enable people to use less energy through collaboration with utility companies to provide households with data on how much energy they are consuming, how they match up with neighbours, and if they are close to any new milestones. Another solution, m.Paani,[39] aims to solve the clean-water problem in developing countries through an innovative loyalty program. In

gamification, a good blend of information service and online community engagement will result in greater citizen satisfaction in their interaction with the government which in turn enhances public service delivery. More potential is seen for gamification in emerging channels such as mobile devices and social media.

Citizen's unified mailbox

Building on the self-service expectation of citizens, an extension of the email channel takes the form of a unified communication system between governments and citizens. The Government of Denmark, through a legislation adopted in 2012, pledged that by 2014 all citizens would have a secure digital letter box ("Digital Post") in which they would receive all emails from public authorities. All citizens would also be able to authorise family members to access their Digital Post on their behalf. Singapore has also implemented "OneInbox" in 2013, which is the official Government platform where individuals and businesses can receive all their government-related correspondences electronically, in place of hardcopy letters.[40] This service was launched based on findings from surveys and polls that most individuals and businesses prefer to receive electronic correspondences instead of hardcopy letters. Singapore's OneInbox aims to provide a trusted and guaranteed delivery of correspondences and make it easier for individuals and businesses to file and track their correspondences from a single aggregated platform.

Mobile Government Office

With the use of mobile technologies, a physical government office could be set up to provide services to rural villages. The Australian Government Mobile Offices are mobile offices providing a range of government payments and services, making it easier for people in rural communities to conduct their business with Centrelink,[41] targeting older persons, students, jobseekers, persons with disabilities, farmers and self-employed.

5.5. Conclusion

With increasing user demands to access public services from anywhere, anytime and the practical needs to reach out to everyone in society, including disadvantaged and vulnerable groups, new forms of online, hybrid and integrated channels have emerged over the years, transforming the way online services are delivered to citizens. From traditional citizen touch points, like counter and voice services, to evolving forms of online web portals, from SMS text services, mobile portals and mobile apps to social media, an inclusive multichannel approach is seen to be a relevant solution for the sustainability of e-government itself since it allows governments to utilize a multiplicity of the channels to reach out to disadvantaged and vulnerable groups and find smart ways to increase usage of online services.

The web portal, mobile channel and social media channel will be main drivers to reach a wider user base and bridge the digital divide with the exponential uptake of mobile devices and increasing user base, particularly in developing

countries. The mobile channel is essentially one that augments other channels by reaching out to new users but, at the same time, it is a pervasive one that is in close proximity to its users and is action-oriented, meaning that one uses the mobile phone to "do something". The use of social media and social analytics are both complex and fragmented but it has strong potential to reach disadvantaged and vulnerable groups, such as indigenous peoples and youth. Counter (face-to-face), paper-based and telephone (voice) services will continue to play essential roles in public service delivery, especially to reach out to people living in poverty and in low-income countries.

The challenge is to manage the balance of need to support these platforms while encouraging citizens to take advantage of more cost effective digital channels. Public service delivery can, therefore, be reinvented through a smart blend of channel selection and integration, optimizing the characteristics of different channels with the citizen's profile and having a consolidated view and analysis, business needs, cost efficiency, channel performance and social analytics as metrics to govern and streamline the e-government development process.

Given these findings and conclusions, the following recommendations can contribute to an effective and inclusive multichannel approach to public service delivery:

- Profile e-government users and map effective channel(s) to citizen groups and needs. For more efficient and effective delivery of public services, it is more important to understand the needs of citizens that one is targeting and to provide services that address specific citizen needs through a multichannel approach. With a good user profiling exercise, policymakers may then focus on the capacities, both the supply and demand ends and subsequently exploit fully the power of mobile and other channels without leaving out citizens, particularly disadvantaged and vulnerable groups with limited capacities or limited ICT access. Training and upgrading of ICT skills of citizens should not be ignored.

- Build key integrated infrastructure, deploy a unified knowledgebase, set common standards and invest in training to facilitate multichannel provision of public services. Government Chief Information Officers or equivalent officials should plan for an overall ICT infrastructure with emphasis on ubiquity, among other factors. Setting common service standards help address service consistency and interoperability needs. Taking into consideration data security and user privacy, ubiquitous integrated cloud-based multichannel management may be tapped with the spread, availability and reduced cost in its offering.

- Be innovative; learn and replicate good practices from around the world to integrate and optimise channels. Sticking to tried and tested channels will no longer suffice in today's connected information age. Online services should be reinvented through a multichannel service approach. Careful deliberation is needed, for instance, on how email notification and/or SMS text notification can be best integrated into the workflow of an online or mobile application. Governments need to constantly explore and experiment, adapt and hone an integrated multichannel e-government strategy.

- Set indicators and measure impact of channels through usage statistics and social analytics; adapt to emerging citizen needs and technological advancement. The goal of setting indicators and measuring channel analytics is to measure public service performance for promoting data-driven decisions rather than subjective ones for identifying problematic issues or areas of growth. Metrics such as business needs, channel cost and channel usage, as well as intangible ones, like channel perception and citizen satisfaction, should be determined with clear expected accomplishment statements and realistic goals. With increasing knowledge and technological ability to analyze information from disparate sources, governments are able to make wiser use of the plethora of data they collect with predictive and preventive analytics to continuously evolve e-government development to deliver more public value.

Bridging the digital divide

6.1. Introduction

Today 1.2 billion people of the world living in extreme poverty account for only one per cent of the consumption as compared to the richest 1 billion people which consume 72 per cent.[1] The United Nations Secretary-General's High Level Panel on Post-2015 Development has called for a new agenda which "must tackle the causes of poverty, exclusion and inequality. It must connect people in rural and urban areas to the modern economy through quality infrastructure—electricity, irrigation, roads, ports and telecommunications."[2] In outlining his vision for the way forward on Post-2015, the United Nations Secretary-General stated that "in order to leave no one behind and bring everyone forward, actions are needed to promote equality of opportunity."

One key area which can allow for leapfrogging in development outcomes is to think in terms of the benefits derived from mitigating the digital divide as opportunities for wellbeing. The digital divide is inextricably linked to social equity in today's information world. This involves recognition that addressing the multivariate causes of the digital divide go beyond connectivity and capability issues to include human, economic and social wellbeing, lack of which impinge on developmental outcomes, including those for the Post-2015 development agenda.

The emerging imperative today is to re-think the scope of e-government in order to understand the opportunities offered by new technologies for better development outcomes. Governments can enhance the role of e-government in bridging the digital divide by embedding interconnected and holistic technological solutions in policy frameworks.

This chapter looks at trends in digital divide to identify issues which needs ICT and e-government policy redress for

In this chapter:

greater economic, social and environmental sustainability and overall wellbeing for all. The 2014 *Survey* questionnaire includes a set of questions assessing the digital divide in e-government development (see Survey Methodology). All sources of data used in this chapter come from this questionnaire, unless otherwise stated.

While the chapter aims to offer an overall picture of digital connectivity its specific focus is on e-services for vulnerable and disadvantaged populations at the national level, including persons with disabilities, older persons, women and youth. In doing so it seeks a better understanding of the challenges to Member States stemming from this disparity at a time when ICT is at the core of productivity growth and participation in the world economy.

6.2. Characteristics of the digital divide

Initially the digital divide was considered primarily an issue of access to relevant information technology infrastructure compounded by the prohibitive cost of access, especially in the developing countries. As technology has proliferated, the physical and financial access barriers have given way to challenges which stem more from capacity and capability of individuals. Digital divides exist even within seemingly connected populations where access to digital information is impeded for some due to language barriers or lack of culturally-relevant content. A lesser form of disparity in connectivity can also be the result of the 'quality' of connectivity depending upon whether access is through fixed or mobile device, or the Internet or a telephone connection. These are issues of national policy and priority since the quality of usage in terms of access, retrieval, interactivity or digital social inclusion for many depends on political, economic, investment and regulatory policies, among other things.

At the basic level, the digital divide stems from a lack of physical access to technology between groups and individuals. This can be in terms of Internet connection, availability of broadband, computers, smart phones, mobile devices and in general a disparity in access to the communication infrastructure. In many countries this is mainly a supply side issue stemming from differences in the level of development of the country; government policy; priority of the technology regime in the country; IT regulatory environment; private sector involvement; and investment in ICT infrastructure, among others. It is also aggravated by prohibitive pricing of ICT devices.

The digital divide also arises from a disparity between individuals and populations in the levels of education and skills needed to use the technology. The lack of ability to use the technology may stem from differences among Internet users in the capacity to efficiently and effectively find information on the Web to take advantage of the medium in a variety of ways. Disparities in the appropriate use of the information and e-services is particularly relevant to social equity inasmuch as it impacts everything from the ability to gather and use information on an urgent health issue in a faraway village to finding the right government documentation, to emergency announcements at the time of a natural disaster, to participation in elections. Whereas the earlier concept of the digital divide was primarily

about access to technology, the successive levels of the digital divide are about capability and ability. As such digital divide is prevalent in both developed and developing countries.

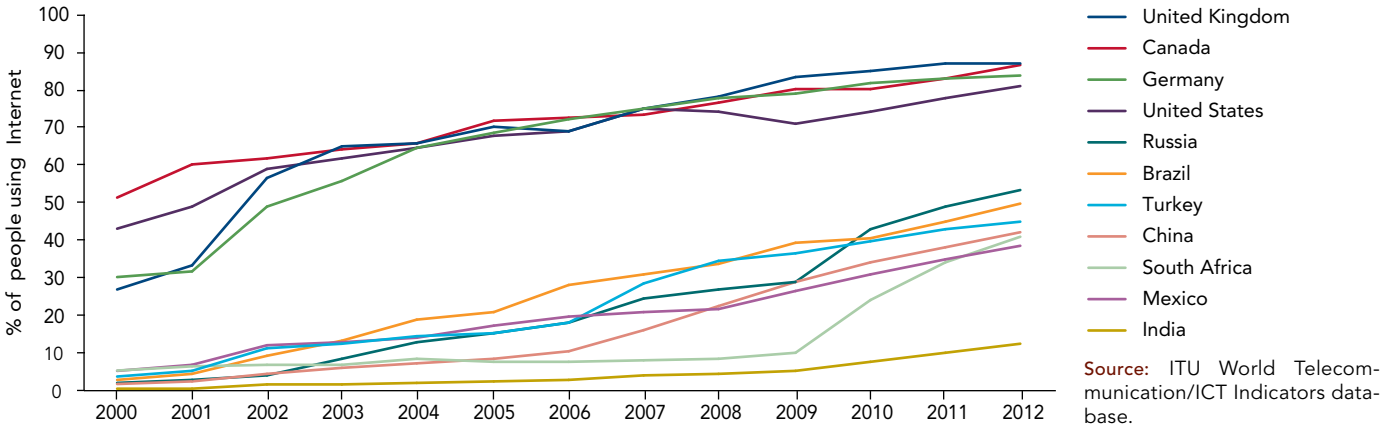
6.3. Disparity in technology access: trends in the digital divide

In the globalized world, whereas technology proliferation and advancement may have allowed for an Internet enabled device in the hands of many, the distance between governments, businesses and the citizen with real access and those with limited access and skills has increased in many countries.

Considerable progress has been made in mitigating the digital divide. As highlighted in Chapter 2, in 2014 for the first time all United Nations Member States demonstrate an online presence. Despite an overall trend towards progress in the past decade, the difference within high income economies, middle and low income developing countries are stark. Even among the G20 economies,[3] which, together comprise 90 per cent of global GDP and two thirds of the world population, the digital divide, as measured by the change in percentage of Internet usage, is apparent. A subset of the G20 counties are illustrated in Figure 6.1. The figure shows that on one hand, countries such the United Kingdom, Canada, Germany and the United States of America are far in advance; and on the other hand, other emerging economic power houses such as Brazil, Russia, China and South Africa have experienced a catching up phenomenon, starting around 2008–2009.

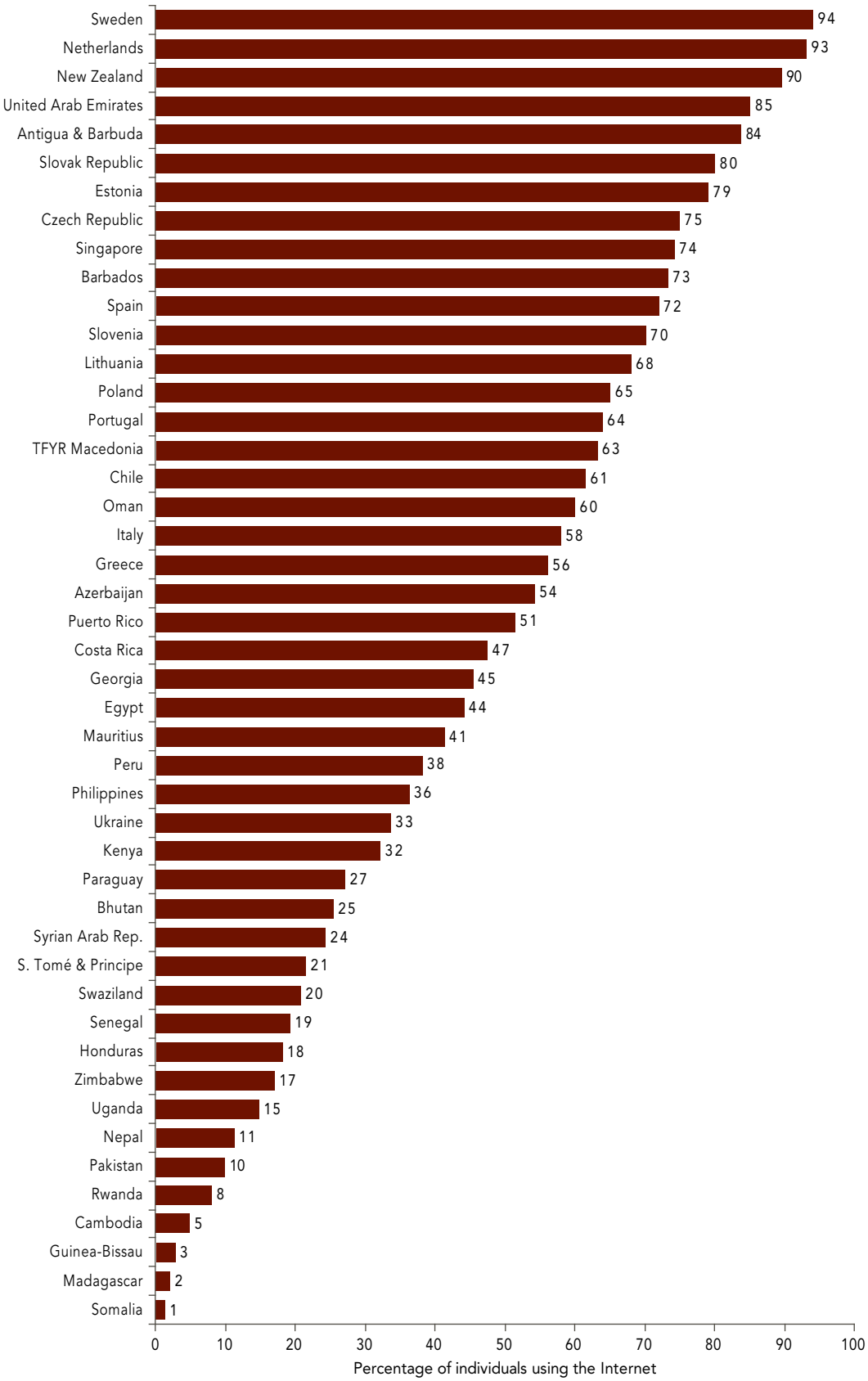
The digital divide between other high and low or middle income countries is substantial too, as measure by the percentage of population using the Internet. For example in 2013, in Sweden (94 per cent), Estonia (79 per cent) and Singapore (74 per cent) a vast majority of the population used the Internet. This is in contrast to Costa Rica, Georgia or Egypt where less than half of the population had access to the Internet. This disparity becomes particularly acute with low income countries such as Guinea-Bissau (3 per cent), Madagascar (2 per cent) or Somalia (1 per cent) (see Figure 6.2).

Figure 6.1. Change in percentage of people using the Internet, selected countries



Source: ITU World Telecommunication/ICT Indicators database.

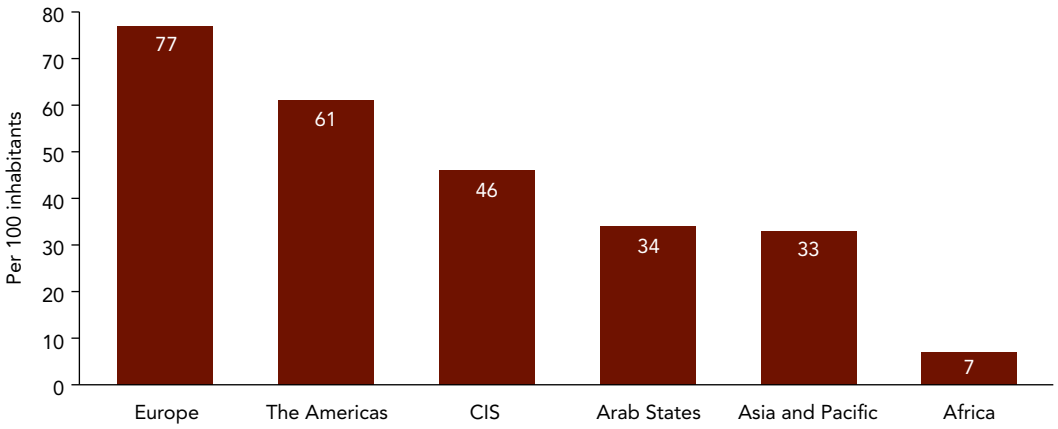
Figure 6.2. Disparity in use of Internet between developed and developing countries, 2013



Source: ITU World Telecommunication/ICT Indicators database. http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx

In addition to the lack of infrastructure, there are other characteristics of the digital divide such as the institutional access where individual access is available only through group spaces such as schools, community centers, or cybercafés because of a high cost or a low level of personal income. This is especially true of millions in the developing world where access is limited by a lack of availability of devices and connection at home or work and, in particular, in Africa which remains minimally wired compared to other regions (see Figure 6.3). Despite over a billion people living in Africa, making up around 15 per cent of the world population, only 7 per cent of the households have Internet access. In Europe, which has 12 per cent of the world population, more than 75 per cent of the households have access to the Internet. In tracking these countries, the *United Nations E-Government Survey* has consistently highlighted that Africa as a whole remains far behind other continents.

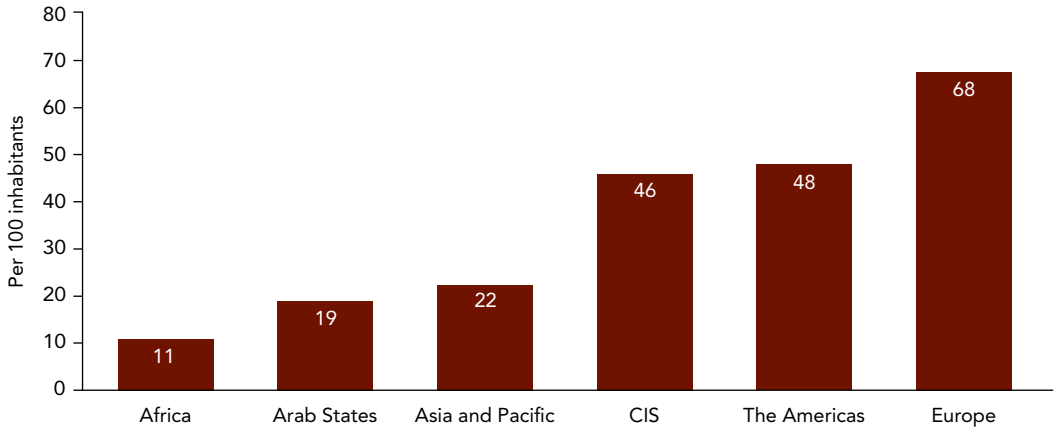
Figure 6.3. Percentage of households with access to Internet in 2013, by region



Source: ITU World Telecommunication/ICT Indicators database. http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx

In many developing countries, among other government policies, telecommunication and regulatory policies have not yielded a fully competitive telecom market resulting in barriers to broadband diffusion. For example, in terms of access to citizens, 68 out of 100 inhabitants in Europe enjoyed an active mobile broadband compared to only 22 out of 100 inhabitants in Asia and the Pacific and 19 in the Arab states (see Figure 6.4).

Figure 6.4. Active mobile broadband subscriptions in 2013, by region



Source: ITU World Telecommunication/ICT Indicators database. http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx

6.4. National income as a determinant of socioeconomic digital disparity

Though proliferation of technology, especially mobile telephony, has caused a burst of digital participation in general, income remains a key determinant of access to technology. Those who are lower on the socioeconomic ladder may face multiple access barriers to engaging in economic, social and political participation. This holds true especially for the most disadvantaged and vulnerable groups who are less wired to the digital economy, even in the advanced economies of the world. A study of 18 European countries found that low income was the single most important barrier to acquiring basic technology with a high-income household 4 times more likely to have access to a computer and the Internet than a low-income one. In the Netherlands and Norway, the probability is around 2.5 times higher and in Portugal, where the high income household is 14 times more likely to possess a computer and Internet than a poor home, the gap is particularly acute (Montagnier & Wirthmann, 2011).

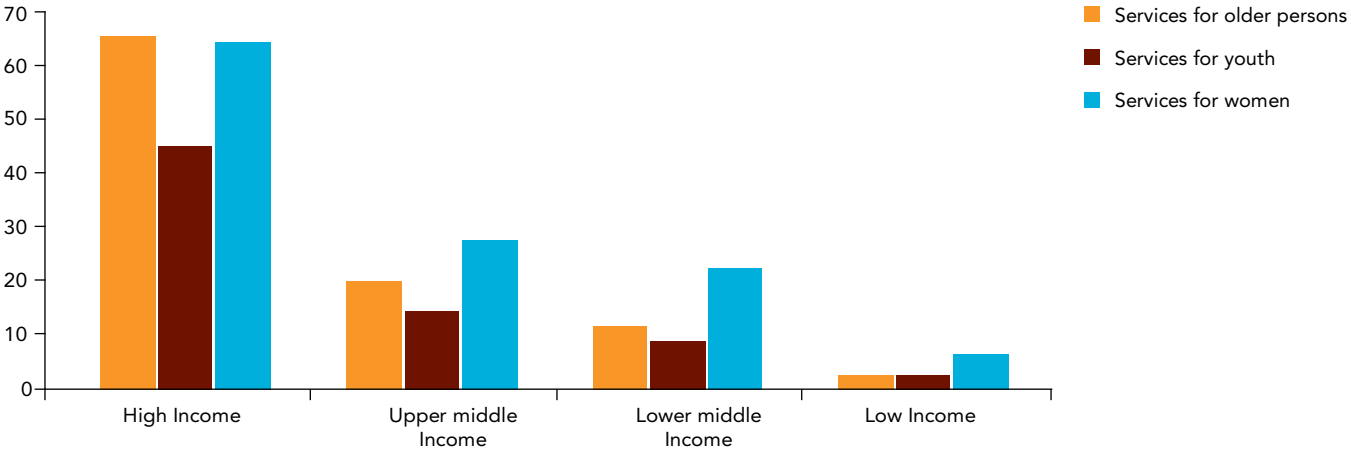
Prohibitive costs to Internet or technology use also prevents populations from access. In Mexico, despite multiple telecommunication providers entering the market, the country has one of the highest connectivity costs among OECD countries resulting in 40 per cent of users accessing the Internet only in public places. In contrast, 90 per cent of households in the upper socio-economic strata in Mexico possess a computer at home.[4]

These trends are especially accentuated for disadvantaged and vulnerable groups. The phenomenon is not limited to countries with lower levels of development but also among the advanced economies. According to Pew research, one in five American adults who does not use the Internet is more likely to be an individual with no high school degree, earning less than US $30,000 per year, older persons or persons with disabilities.[5]

The United Nations Convention on the Rights of Persons with Disabilities in its Article 21 requires that countries 'Promote access for persons with disabilities to new information and communications technologies and systems, including the Internet'.[6] But progress in digitally connecting persons with disabilities and other disadvantaged and vulnerable groups has been slow, especially in the developing countries. As Figure 6.5 depicts, the proportions of key online services for persons with disabilities, older persons, women and youth were far more readily available among the high income and upper middle income countries than in countries with a lower tier of gross national income per capita.

Some of the 36 high income countries providing services for older persons are Australia, Austria, Bahrain, Belgium, United Arab Emirates, United Kingdom and the United States. Eleven countries from the upper middle income group providing for older persons are Azerbaijan, Belize, China, Colombia, Ecuador, Hungary, Kazakhstan, Malaysia, Mexico, Peru and Tunisia. Among the lower middle income only four countries, Bolivia, Georgia, Mongolia and Morocco provided the same while Rwanda is the only low income country providing any services directly aimed at older persons.

Figure 6.5. Services for disadvantaged and vulnerable groups, by income



Income is only one contributory factor, albeit a major one, in provision of services which also depend on government priority, policy and focus on e-inclusion. These patterns are witnessed across subregions as well. For example in South-Eastern Asia, Singapore—a high income country—provides more than 70 per cent of the services to disadvantaged and vulnerable groups far in advance of Indonesia (36 per cent); Vietnam (29 per cent) and Cambodia (14 per cent). As can be seen from Table 6.1, Thailand, Indonesia and the Philippines, though at lower per capita income level, offer a higher level of services to disadvantaged and vulnerable groups compared to Brunei Darussalam—a high income country. This is also apparent in the case of some middle income countries of Central America. Mexico, Panama and Costa Rica in the middle income range of US$ 13,000–17,000 nevertheless provide varying levels of services with Panama and Costa Rica far less than Mexico as well as Belize—a country with a much lower GNI per capita at US$ 7,529.

Table 6.1. National income and provision of services to disadvantaged and vulnerable groups in South-East Asia

	Percentage of services	*GNI per capita (2013)*
Malaysia	86%	17143
Singapore	86%	61803
Indonesia	36%	4956
Brunei	29%	53348
Philippines	29%	4413
Thailand	29%	9815
Vietnam	29%	3635
Cambodia	14%	2494
Lao	14%	2926
Myanmar	14%	1300
Timor-Leste	14%	1709

Table 6.2. Downloadable forms for disadvantaged and vulnerable groups

	Total number of countries	*Downloadable forms for disadvantaged and vulnerable groups*
High income	55	46
Upper Middle Income	56	30
Lower Middle Income	46	20
Low income	36	1

Box 6.1. Brazil's efforts at mitigating the digital divide: universal access to the web

The government and civil society have teamed up to bridge the digital divide for the millions of Brazilians. The Rede Marista de Solidariedade—a Porto Alegre-based non-profit organization focused on social inclusion and solidarity through social projects—seeks to help bridge the digital gap in Brazil by promoting universal access to the web. New in the community of Nova Santa Marta—located in the Rio Grande do Sul city of Santa Maria—the region with the lowest human development indexes of the state, the Marista network established a Center for Digital Inclusion which focuses on areas such as meta-recycling, free robotics and tele-centers. The initiative was first implemented in a Computer Refurbishment Center in Brazil in 2005 with the support of the municipality of Porto Alegre, the Hospital Conceição healthcare group, development organization Avina Foundation and drinks producer Vonpar. The work carried out by the Computer Refurbishment Center has so far benefited thousands of users in tele-centers and schools with the donation of refurbished computers. The project offers training in hardware and free software to about 100 young apprentices from among the socially vulnerable populations.

Source: http://itdecs.com/2011/06/case-study-brazilian-ngo-fights-digital-divide/

A key useful service for disadvantaged and vulnerable groups would be the facility to download forms. Of the 55 high income countries, 46 or 84 per cent, provided downloadable forms specifically for services aimed at older persons, women and youth compared to around half of the upper middle income countries. Some of the upper middle income countries which provided online forms were: Angola, Argentina, Azerbaijan, Belize, Bosnia and Herzegovina, Botswana, Brazil, China, Dominican Republic, Ecuador, Islamic Republic of Iran and Malaysia. It is notable that the number of countries providing the same became much less in the case of lower middle income and was negligible among low income where only Burkina Faso provided any downloadable forms.

6.5. ICT skills, language and content barriers

Educational disparity is another contributory factor of the digital divide. A strong correlation exists between the education and literacy on the one hand and the ability to use technology on the other. Education is the most important determinant of the intensity of Internet use. This allows advanced countries with a solid human resource base to remain far ahead of others. According to one study the probability of an individual using the Internet everyday increases by 2.4 times in Europe and by 3.6 times in the Republic of Korea if he has a university degree and above (Montagnier & Wirthnann, 2011). A first step to being ICT literate in today's information age is the availability of a computer and a certain level of information literacy.[7]

Whereas a basic level of technology and its use may allow for some integration into a digital economy, digital inclusion will still require an enhanced set of skill tools. For example, though smartphones have ushered in innovative means of providing those with no access, no education and no skills in many developing countries with opportunities to transact and participate, a smartphone is not a substitute for a wired connection because of the limitations of what it can do such as filling up a form which is hard to do on a hand-held device. Further, not all websites allow for smartphone optimization, so some cannot be accessed, or if they can, they may not show all the content.

Language and content barriers

The ability to understand, use and deploy the Internet content determines the extent to which one can participate in the economy and the society. Conversely, inability to use one's language on global information networks affects the capability of populations to avail of the benefits of technology and adds to the digital divide. As can be seen from Table 6.3, even in 2012, barriers from inaccessibility to own-language content remain, with 56 per cent of the Internet content in English which, though, only a quarter of the total users can understand.

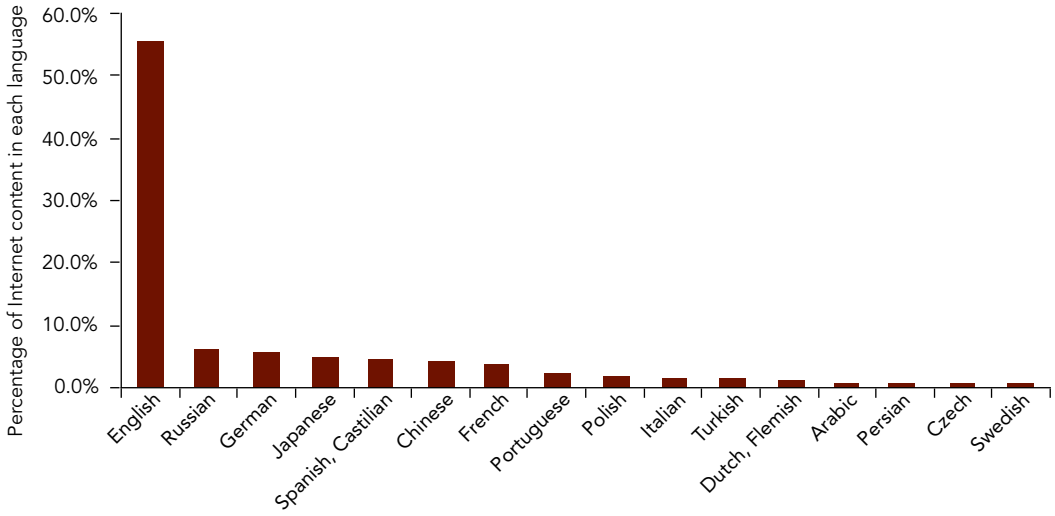
Whereas some progress has been made to offer other languages in the last decade, the overwhelming content still remains in English as seen in Figure 6.6.

Table 6.3. Disparity in Internet content and language

Language	*% of Internet users by language*	*% of content on the Internet*
English	27	56
Chinese	25	4
Spanish	8	4
Portuguese	4	2
German	4	6
Arabic	3	1
French	3	4
Russian	3	6

Source: Language by content statistics from W3Techs. Web technologies Surveys. http://w3techs.com/technologies/overview/content_language/all. accessed 13 September 2013
Data for Internet users from: World Internet Users Statistics. 30 June 2012. http://www.internetworldstats.com/stats7.htm

Figure 6.6. Lack of content in own language as a barrier to accessibility, selected countries



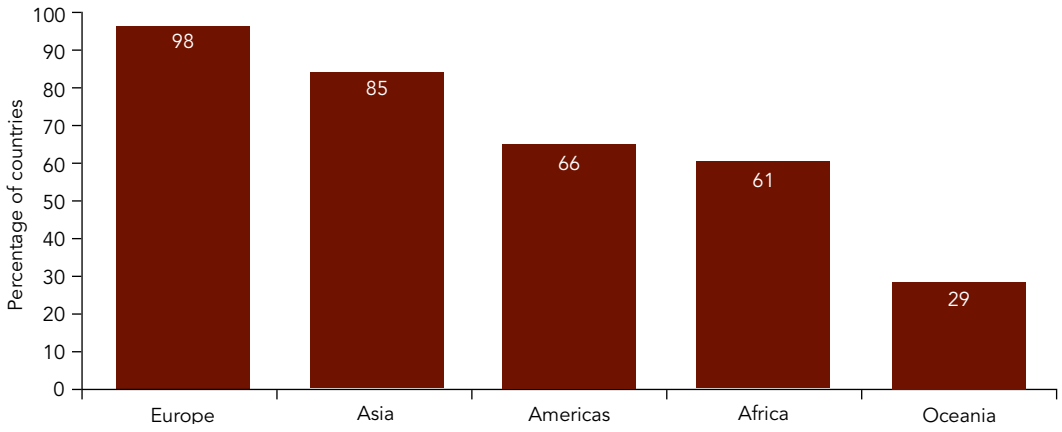
Source: Language by content statistics from W3Techs. Web technologies Surveys. http://w3techs.com/technologies/overview/content_language/all. accessed 13 September 2013

The adverse impact of lack of relevant content contributes to the digital divide in two ways. First, for example, despite the fact that India had manifold increase in Internet users from 5 million in 2000 to 137 million in 2012,[8] literacy is comparatively low at 74 per cent.[9] This means barriers to Internet access remain for over 300 million people. Secondly, of those who can access the Internet, the majority cannot speak English. Unless users have some knowledge of the English language—regardless of how good machine translators become—they will be barred from the vast reservoir of information available in the electronic world.

The increase in the use of more than one language on national portals is particularly notable. This convenience is likely to draw in special populations such as immigrants who may not be fully conversant in the widely spoken national language. In 2014, 74 per cent of the national portals offered the facility of information in more than the national language compared to 54 per cent in 2012. The progress is regionally spread with almost all of the European countries; 85 per cent in Asia; 66 per cent in the Americas and 61 per cent in Africa (see Figure 6.7). In Africa, around two thirds of all countries offered more than one language. Though Oceania is the least accessible in this regard, as a whole, special efforts have been made in Australia where among others, a special programme has taken a holistic approach to community building and economic development using new technologies as tools to provide equal access to all (see Box 6.2).

There has been much progress in the design of websites to allow for configuration and options of font size, font type, font and background color to increase the flexibility and appeal of national portals to greater users. In 2014, 40 per cent of countries allowed for flexible font size and type compared to 31 per cent in 2012.

Figure 6.7. Online services in more than one language, by region



Source: Human development data from UNDP International Human Development Indicators, http://hdr.undp.org. Accessed: 9/15/2013

Box 6.2. e-ACE Project in Australia: providing language content to integrate communities

The electronic Atherton Community Enterprise, or e-ACE, is Infoxchange Australia's first and longest running digital inclusion project. It focuses on worldwide communications, alongside education, skills development, improved health and well-being, access to health and community services and employment opportunities. Local information has been made available in multiple languages and residents are easily able to access local employment and training opportunities through the e-ACE intranet, as well as connect with their family and friends on the other side of the world. Without the technology made available to them through the e-ACE project, most Atherton Gardens residents, mainly low income earning, migrants or the children of migrants, would have not been able to access a computer at all.

Source: http://www.infoxchange.net.au/welcome-digital-inclusion-program/

Figure 6.8. Accessibility attributes on national websites, by region

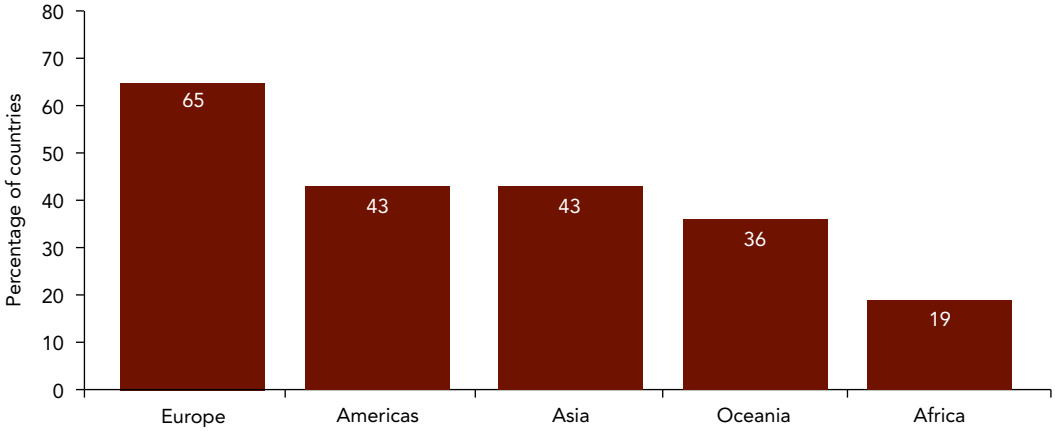
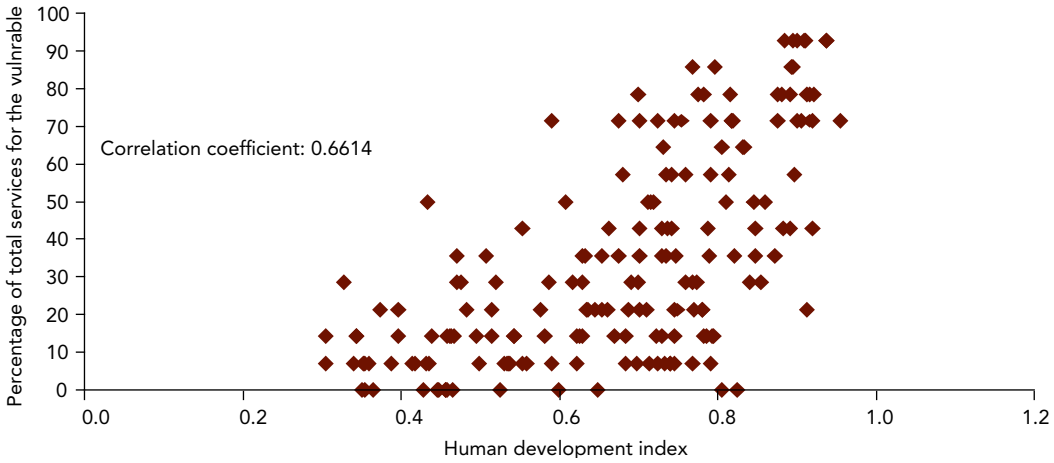


Figure 6.9. A higher percentage of total services are aimed at disadvantaged and vulnerable groups in high human development countries



6.6. Lack of e-services for disadvantaged and vulnerable groups compounds digital disparities

There has been progress in e-services aimed at disadvantaged and vulnerable groups. In 2012, the *United Nations E-Government Survey* assessed that 28 per cent of the national government websites contained specific sections on at least one of these groups; by 2014, 64 per cent of the national government portals and websites provided integrated links to sources of archived information (policies, budget, legal documents, etc.) related to disadvantaged and vulnerable groups, namely people living in poverty, persons with disabilities, older persons, immigrants, women and youth.

Clearly understanding the link between the burgeoning online opportunities and human wellbeing, many of the developed countries have a stated policy of e-inclusion of the disadvantaged and vulnerable groups in society which are generally the last to come on board the technology train. Cross country comparisons show evidence of this divide for the disadvantaged and vulnerable groups among countries of the world. Figure 6.9 indicates that countries with higher human development index pay greater attention to e-inclusion of vulnerable groups. Programs aimed at building skills for the vulnerable groups have encompassed special ease-of-use features for persons with disabilities, older persons, women and youth.

In Africa, online services for disadvantaged and vulnerable groups remains lower than in other regions, with only 4 per cent of countries offering services for the poor and the persons with disabilities. In Asia, the disabled and vulnerable group that receives most online services is the immigrants with 38 per cent of countries offering this service. Oceania has 14 per cent of countries offering services to the older persons, persons with disabilities and the immigrants. Services for the poor are available in 21 per cent of the countries in Oceania. Finally, in the Americas, 31 per cent of countries present services for the persons with disabilities and the older persons (see Table 6.4).

Table 6.4. Overview of online services for disadvantaged and vulnerable groups

Region	*Services for poor*	*Services for persons with disabilities*	*Services for older persons*	*Services for Immigrants*
	Per centage of total countries in the region			
Africa	4	4	6	7
Americas	20	31	31	17
Asia	34	32	30	38
Europe	47	53	53	44
Oceania	21	14	14	14

Box 6.3. US portal devoted to disability providing comprehensive services

The US portal on disability states 'We are committed to ensuring that Disability.gov is accessible to all visitors'. Under US Section 508 of the Rehabilitation Act of 1973, which was enacted to eliminate barriers to information technology for people with disabilities by requiring federal government agencies to provide comparable information and data to individuals with or without disabilities, the site provides a plethora of features for ease of use of People with Disabilities, Caregivers, Children & Youth, Employers & Human Resources Specialists, Health Care Providers, among other. The site is regularly monitored to ensure that it meets and exceeds the requirements of Section 508.

Source: https://www.disability.gov/

The disparity between regions is replicated between countries of a region and sub region indicating differential in approach, policy, programme, investment and focus on bringing disadvantaged and vulnerable groups into the fold of technology benefits. Figure 6.10 presents the disparity in provision of online services for disadvantaged and vulnerable groups in selected subregions.

Among selected economies of Eastern Europe, Hungary, Russian Federation, Czech Republic and Poland are far in advance of provision of online services to disadvantaged and vulnerable groups as compared to Belarus and Ukraine. Similarly, in Southern Asia, India and the Islamic Republic of Iran provided 43 per cent followed by Bangladesh, Nepal, Pakistan, Maldives and Sri Lanka at 21 per cent of online services to vulnerable groups (see Figure 6.10).

The *United Nations E-Government Survey 2014* for the first time tracked specific services for immigrants as a group. As Figure 6.11 shows, 44 per cent of the countries in Europe and 38 per cent in Asia have some services earmarked for immigrants. In Asia, China, Kazakhstan, Japan, Mongolia, the Republic of Korea, Pakistan, Maldives and Sri Lanka offered services while in Europe, Czech Republic, Lithuania, Norway, Sweden, United Kingdom were among those putting out information and services for the immigrants.

Figure 6.10. Online services for disadvantaged and vulnerable groups in Eastern Europe and Southern Asia, selected countries

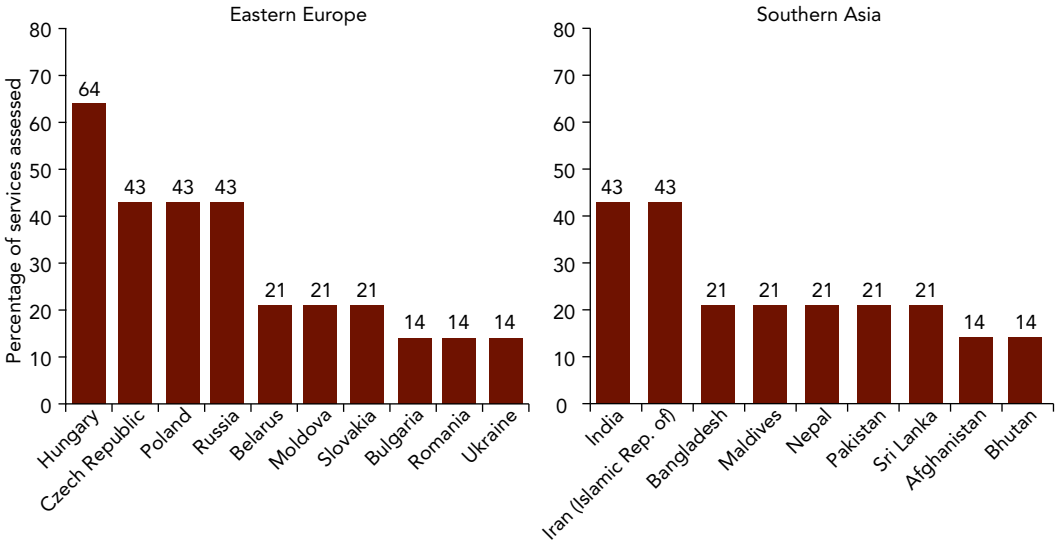
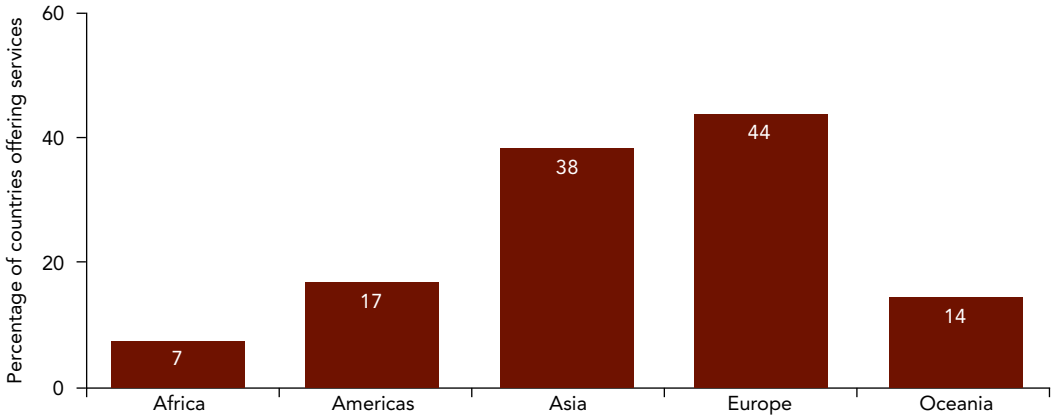
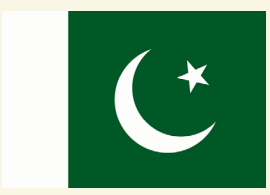


Figure 6.11. Online services for immigrants, by region



As in the case of other services national priority and policy plays an important role in provision of services. In Pakistan immigrant services are among the first and foremost reflection on the national portal (see Box 6.4).



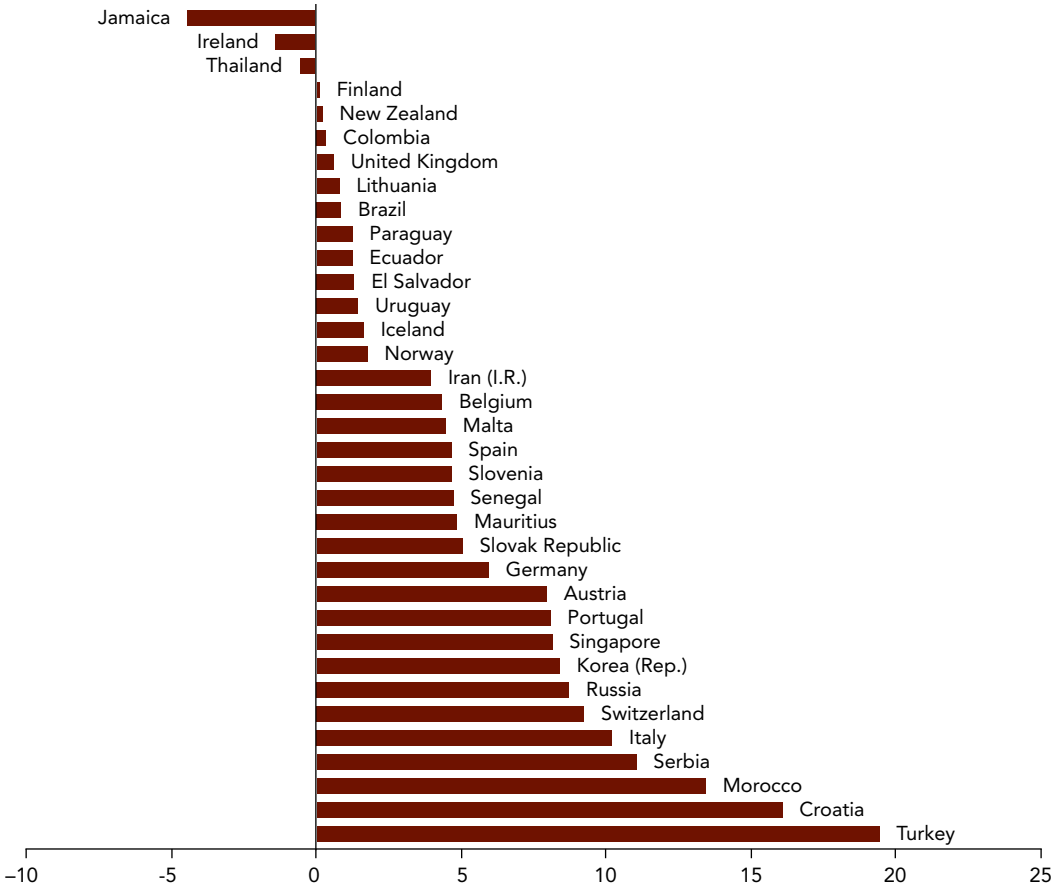
Box 6.4. Pakistan puts immigrant services among the top popular searches

Among other causative factors in the provision of specific services for disadvantaged and vulnerable groups is the focus and priority of a government. In the case of Pakistan a newly revamped national portal puts immigrant services among the top under popular searches.

Source: National portal of Pakistan. http://www.pakistan.gov.pk

The digital divide is also a function of existing disparities in access by gender, demographics, rural-urban and of marginal groups on the fringes of mainstream society. Barring a few countries such as Jamaica, Ireland and Thailand, where there are more women users of the Internet than men, the majority of countries display the norm where men have an edge over women (see Figure 6.12). It is notable that in Jamaica 29.8 per cent of women are Internet users compared to 25.4 per cent of men. In Finland and New Zealand it is pretty much equal while in the Russian Federation (47.5 for men and 38.8 for women): the gap is much higher in countries such as Croatia (71.9 per cent for men to 55.8 per cent for women) and Turkey (52.9 per cent for men and 33.5 per cent for women). Though the differences have become smaller, they still remain large in several countries contributing one more factor to the overall digital divide. Because educational levels in general are lower for women in developing countries than men, their access opportunities are likely to be lower.

Figure 6.12. Disparity in use of Internet between men and women

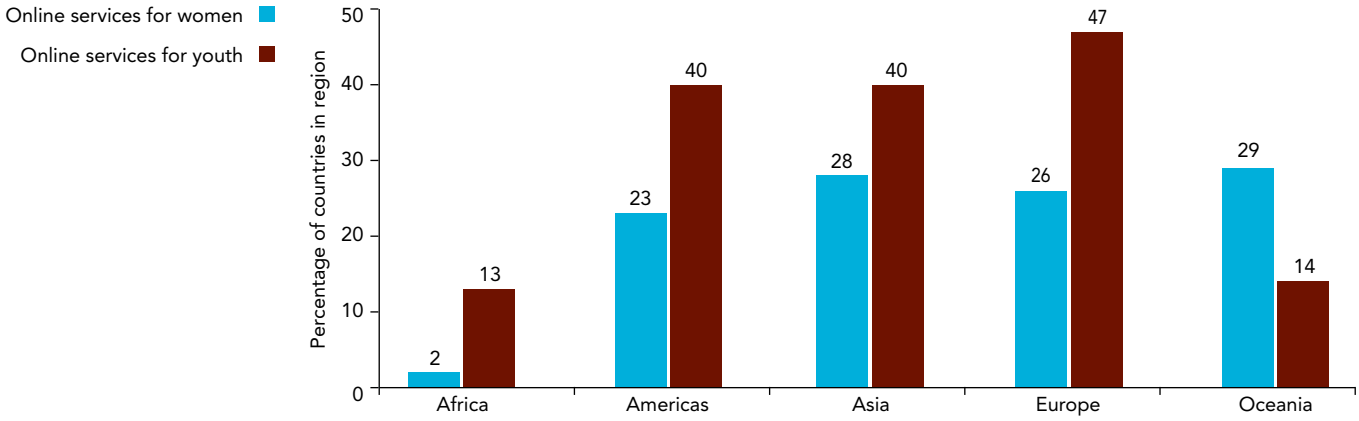


Source: Data from the ITU, based on national sources and Eurostat. http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx

The causes of this gender divide can stem from disparities between men and women in terms of a lack of education, lack of income, social attitudes towards female usage of technology, women having to balance their roles of mother and worker and lack of Internet content relative to women's needs.

Despite the fact that young people are far more likely to be online, as compared to women as a group as well as the overall population, national government online services geared specifically towards the youth are still taking off. Disparities abound across all regions and are likely to be linked to the policy, level of development and national income of a country. In the more advanced regions, such as Europe and the Americas, 47 per cent and 40 per cent of the countries provide specific services geared to the young on their national websites (see Figure 6.13).

Figure 6.13. Countries providing online services for women and youth, by region



Among upper middle income countries Belize, China, Islamic Republic of Iran, Kazakhstan are among those providing specific services for women while Argentina, Belize, Colombia and Cuba are among those providing services for youth. Around a quarter of the countries of Europe and the Americas had specific information aimed at these groups on their websites.

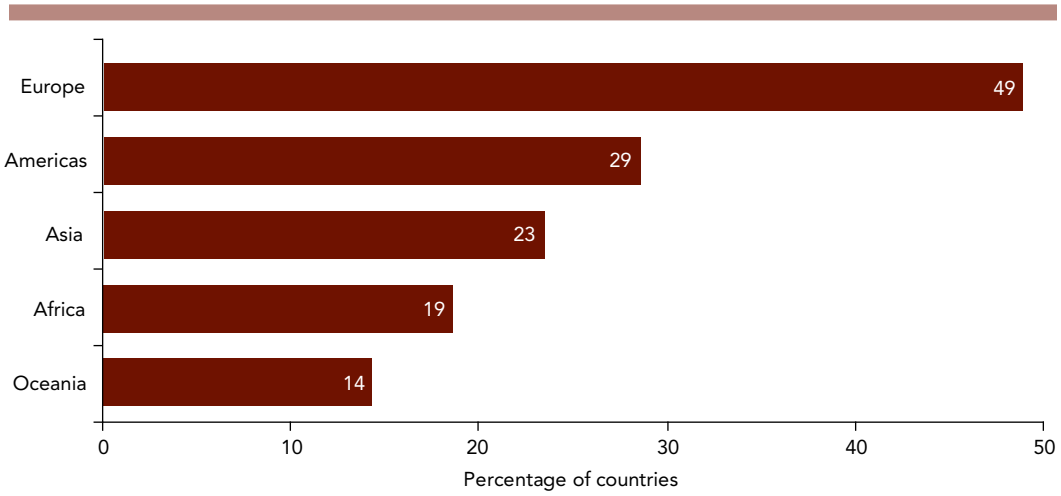
It is also notable that a large number of countries are now providing more archival information related to government policies and programs (see Table 6.5). In 2014 more than 50 per cent of the countries in the world regions, except for Africa, provided some data pertaining to disadvantaged and vulnerable groups. Despite not keeping up with the world averages in general, in terms of data, Africa was behind other regions with 28 per cent of the countries providing data pertaining to disadvantaged and vulnerable groups. Among these were Egypt, Gabon, Kenya, Madagascar, Mauritania, Mauritius, Morocco, Niger, Nigeria, Rwanda and Zimbabwe.

Table 6.5. Online archived information and data for disadvantaged and vulnerable groups

Region	*Archived sources of information*	*Data*
	% of countries	*% of countries*
Africa	41	28
Americas	69	69
Asia	68	51
Europe	86	60
Oceania	57	57

About half the countries in Europe and around one third in the Americas offered email or Really Simple Syndication (RSS) services to disadvantaged and vulnerable groups while the same in Africa was 19 per cent (see Figure 6.14). Among the sub regions of Africa, six countries in Eastern Africa—Kenya, Mauritius, Mozambique, Rwanda, Tanzania and Zimbabwe—offer the user the option to subscribe to updates via email or RSS feed on services related to disadvantaged and vulnerable groups, namely people living in poverty, illiterate persons, persons with disabilities, older persons, immigrants, women and youth. While Morocco in Northern Africa, Nigeria in West Africa and Sao Tome and Principe in Central Africa were alone in their sub regions. No country in Southern Africa provides RSS feeds aimed at these disadvantaged and vulnerable groups.

Figure 6.14. Updates via email and RSS source, by region



SMS services for disadvantaged and vulnerable groups were even less readily available with only about eight per cent of the countries of the world offering mobile apps or SMS service in regards to any of the disadvantaged and vulnerable groups.

6.7. Conclusion

The global disparities in digital access have socioeconomic implications in today's world, contributing to barriers to information and knowledge on the one hand and access to services on the other. With increasing online opportunities of employment, jobs, entrepreneurship and personal development, large groups are deprived through a lack of basic access to technology.

The digital divide has implications for the Post-2015 development agenda. While national governments have moved beyond connectivity parameters to employ ICT and e-government for service delivery aimed at e-inclusion, a broadening of the scope of these efforts is required to capture innovative technology solutions for poverty reduction and other development outcomes in the Post-2015 agenda. Meaningful access to ICT has gone beyond connectivity issues to embrace

human, economic and social resources, institutional structures and governance networks, which are central to developmental outcomes. A number of recommendations can be inferred from this Chapter.

- From a policy standpoint, efforts at bridging the digital divide must be broad based across the policy spectrum and include government leaders at the highest levels. At the national level, it is important to provide for policies that are aimed at equal opportunities for ICT access and inclusion.
- Formulation of a coherent and coordinated ICT policy at the national, regional and local levels should include a strategic framework identifying costs and benefits to the persons living in poverty and other disadvantaged and vulnerable groups.
- New ICT policies should address gender sensitive issues, including women's and girls' access to education, as well as to higher levels of decision-making at all levels.
- Governments also need to revisit the strategic framework of ICT access for the disadvantaged and vulnerable groups in terms of both increasing the level and reducing the cost of connectivity, which in some countries is prohibitively expensive.
- Following the example in some countries, governments in developing countries can support research and development to encourage the production of low-cost ICTs to enable the vast majority of people to have access.
- Finally, particular attention needs to be paid to the development of culturally relevant online content and services, especially aimed at supporting access for indigenous peoples.

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-

In this chapter:

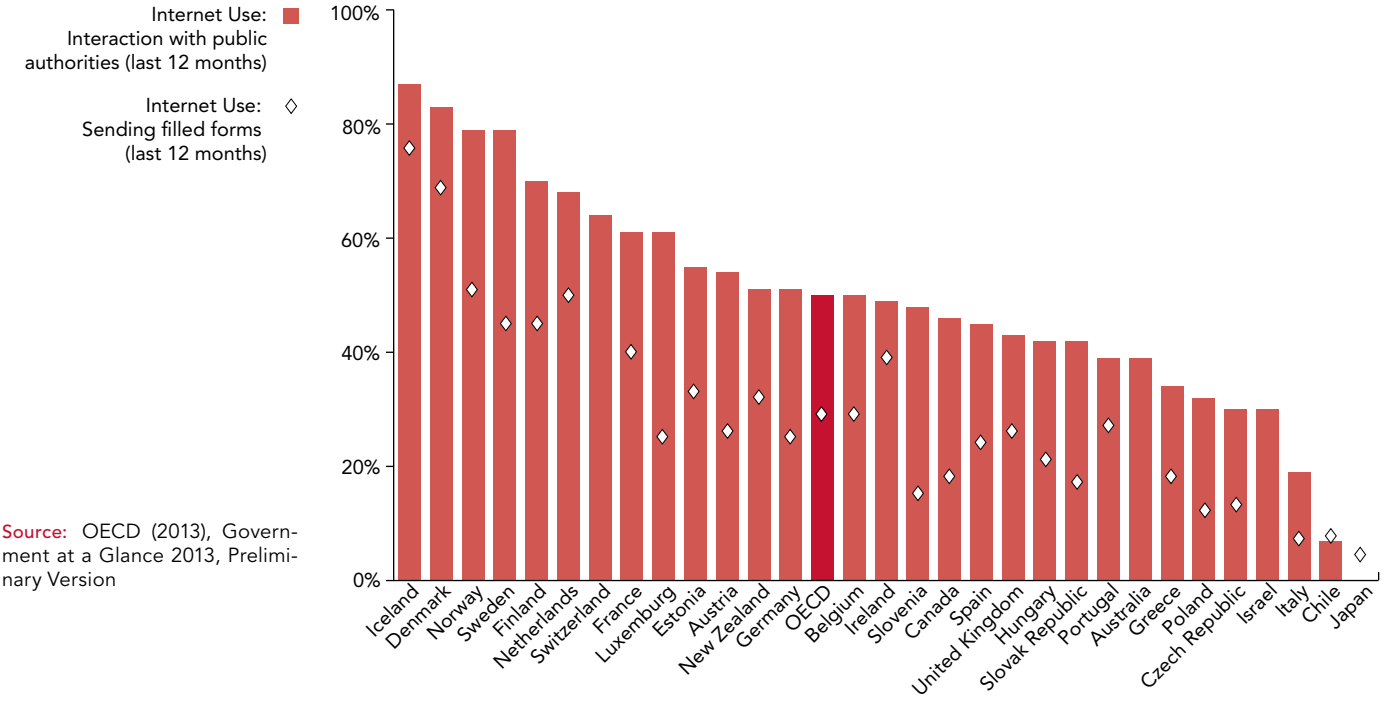
Chapter 7

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)



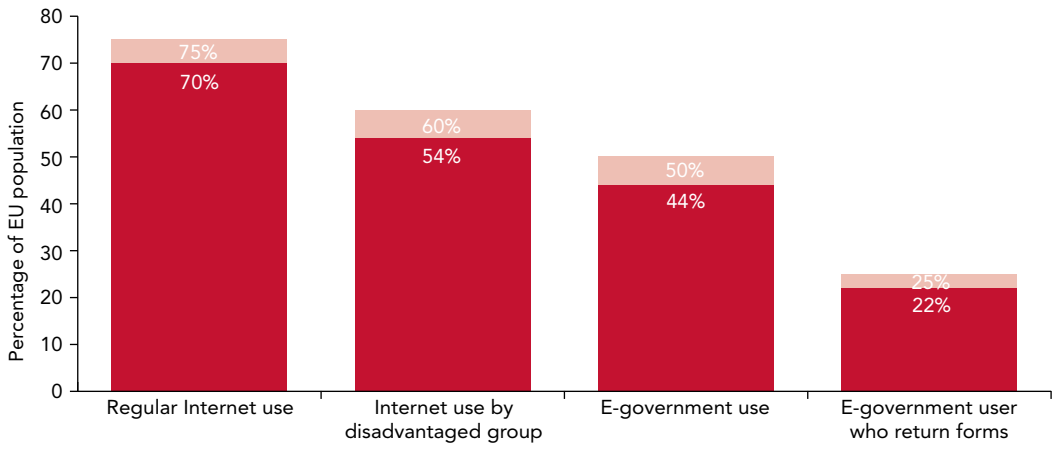
Source: OECD (2013), Government at a Glance 2013, Preliminary Version

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

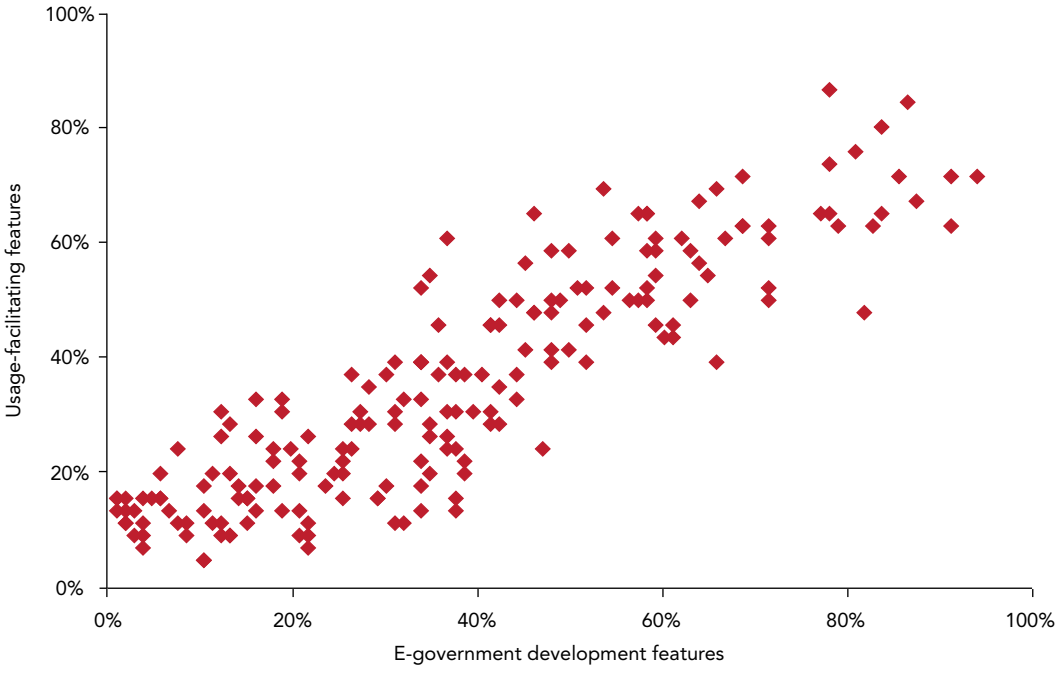
Some governments make explicit efforts to encourage their citizens to use more advanced e-services, which has, however, not proven easy, for reasons such as security. For example, less than half of the taxpayers have adopted e-personal income tax filing in Malaysia, despite the promise of faster refunds 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.

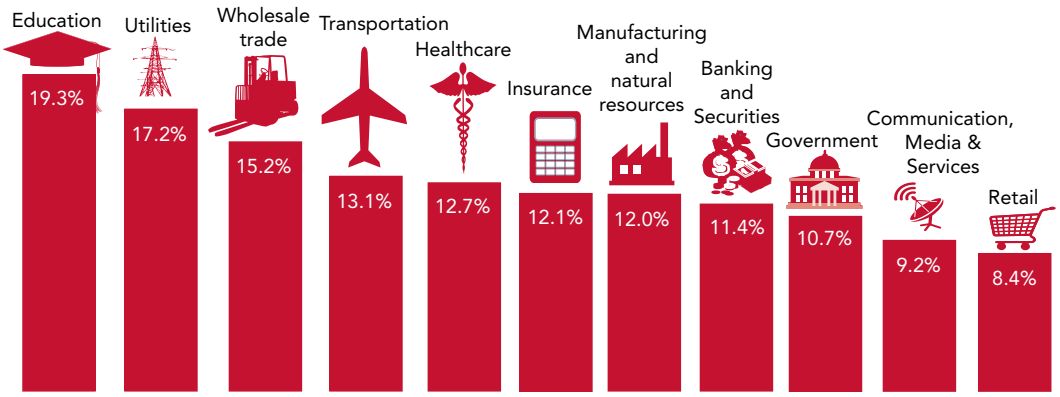
Moreover, as an increasing number of governments push for greater technology integration in schools, sometimes with large-scale initiatives, insufficient broadband can become more pronounced, posing a real problem for e-education service uptake. For example, 64 per cent of the Turkish teachers using 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).

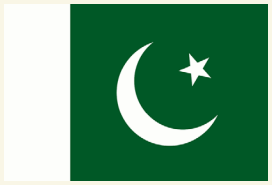
Source: Founder of CyberSmart Africa

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.

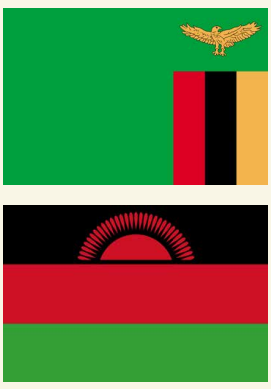
In this connection, *Mwana* (an m-health project using SMS to deliver early infant HIV test results in Malawi and Zambia) merits special attention, as it presents one of the few projects that has been successful on a large scale, covering almost all of Zambia and Malawi (see Box 7.4). It also shows that 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

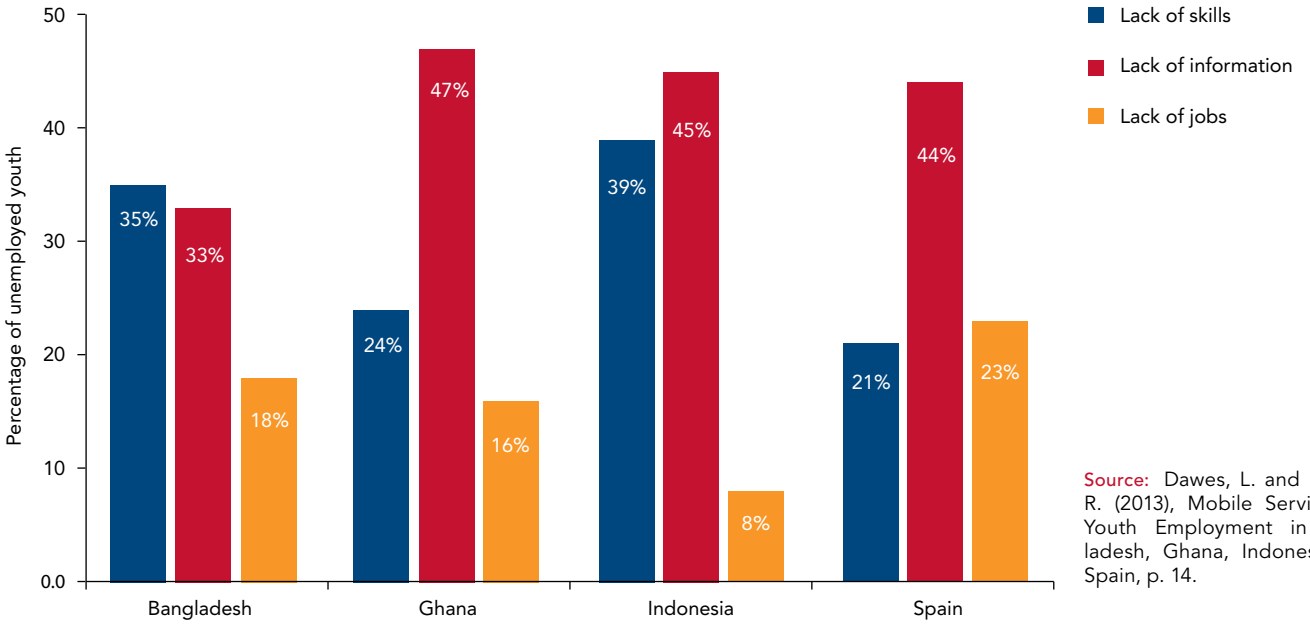
E-employment service usage

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-

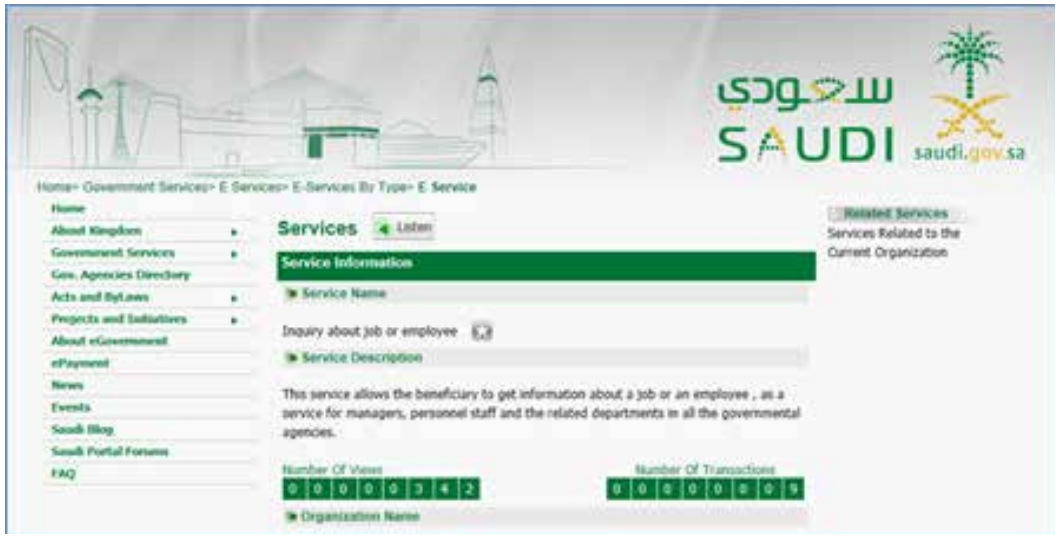
mary source of employment opportunities and 21 per cent of youth used the Internet as a means of accessing job information. Overall in these countires, 73 per cent of the young people surveyed felt that job information is insufficient.[30] In this connection, Saudi Arabia's government website meets many 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

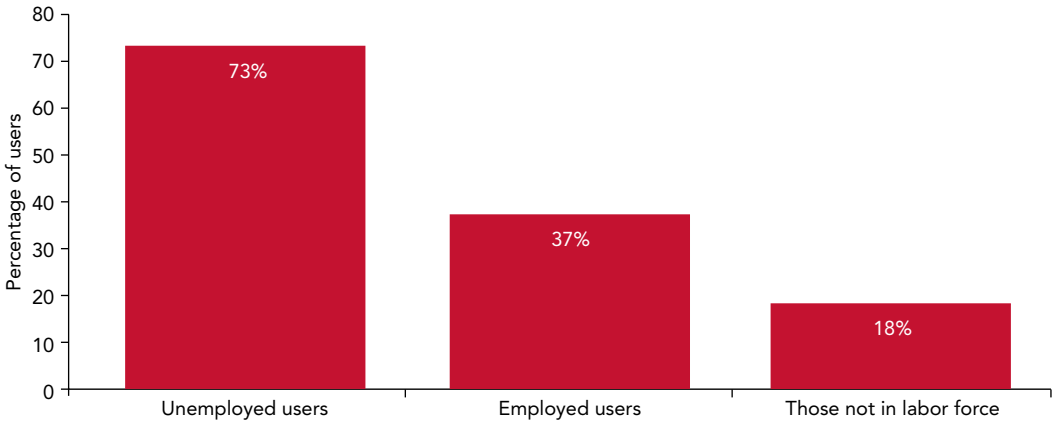


Source: Saudi government website: http://www.saudi.gov.sa/

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.

Open Government Data

8.1. Introduction

One of the tools used to increase transparency and participation is Open Government Data (OGD), which can be defined as government information proactively disclosed and made available online for everyone's access, reuse and redistribution without restriction. The term OGD came into prominence relatively recently after the publication of a set of principles by a group of experts and advocates in Sebastopol, California, United States of America. Often referred to as the "8 Open Government Data Principles" or "Sebastopol Principles",[1] they set out best practice recommendations on how governments publish data on the Internet.

OGD introduces a new approach to publishing government data and helps bridge the gap between government and citizens. It represents the ability of all stakeholders to have full and free access to public data and opens up the opportunity for people to evaluate the performance of various administrative institutions. Combined with the use of modern ICTs, this open platform allows for greater accessibility of key records to a much wider audience. Making data easily available gives citizens the opportunity to make informed decisions about public policies and identify development opportunities. Consequently, opening up government data can lead to more efficient use of resources and improved service delivery for citizens.

In this chapter:

Chapter 8

8.2. Global and regional trends

8.2.1. Survey findings on Open Government Data

The 2014 *Survey* introduced new questions to assess the level of data publishing in national portals. The *Survey* started its assessment with the basic premise that all government data can be made public as long as there are no conflicting privacy or national security concerns. During the initial assessments, researchers looked for the mere presence of datasets in national government portals. In the succeeding assessments, they evaluated and categorized the type of data available according to sectoral focuses, such as education, health, finance, social security, labour and environment. Table 8.1 summarizes the main features of Open Government Data assessed in these national portals.

Table 8.1. Summary of features assessed related to data publishing

Existence of datasets in government portals including sectoral datasets for education, health, finance, social security, labor and environment
Existence of dedicated portals for data publishing such as open government data catalogues
Availability of datasets in various technical formats particularly in those formats that enable accessibility
Number of different government agencies that provide datasets
Guidelines by government agencies describing how to make use of datasets
Availability of datasets on location information such as maps
Availability of public channels to propose new datasets

The 2014 *Survey* questionnaire includes a set of questions assessing the development of data publishing (see Survey Methodology). All sources of data used in this chapter come from this questionnaire, unless otherwise stated. Table 8.2 presents the countries that scored higher than 66.6 per cent on data publishing in 2014. Figure 8.1a highlights the regional representation of countries with a higher than 66.6 per cent score in data publishing.[2] 21 countries from Europe, 15 from Asia and 9 from the Americas are on this list, as well as 3 African countries and 2 countries from Oceania. Figure 8.1b presents the distribution of countries with a score higher than 66.6 per cent according to income level; 86 per cent of these are high income or upper middle income countries. India, El Salvador, Georgia, Morocco, Republic of Moldova and Sri Lanka constitute the lower middle income bloc. Kenya is the only low income country on the list.

As the next step, researchers tried to locate sectoral datasets for education, health, finance, social security, labour and environment, as well as checked for the availability of any data related to disadvantaged and vulnerable groups, including immigrants, women, youth, people living in poverty, the illiterate, persons with disabilities and older persons. According to Figure 8.2, 130 United Nations Member States share data on government spending, 115 on education

Table 8.2. Countries with a score higher than 66.6 per cent in data publishing

Albania	Denmark	Italy	Netherlands	Singapore
Australia	El Salvador	Japan	New Zealand	Spain
Austria	Estonia	Kazakhstan	Norway	Sri Lanka
Bahrain	Finland	Kenya	Oman	Sweden
Belgium	France	Latvia	Peru	Thailand
Brazil	Georgia	Lithuania	Portugal	Tunisia
Canada	Germany	Luxembourg	Qatar	United Arab Emirates
Chile	India	Malta	Republic of Korea	United Kingdom
China	Ireland	Mexico	Republic of Moldova	United States of America
Costa Rica	Israel	Morocco	Saudi Arabia	Uruguay

Figure 8.1a. Countries with a score higher than 66.6 per cent, by region

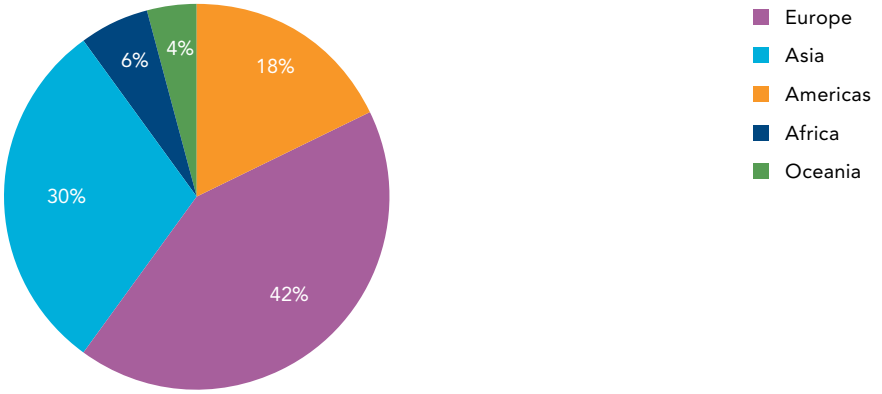
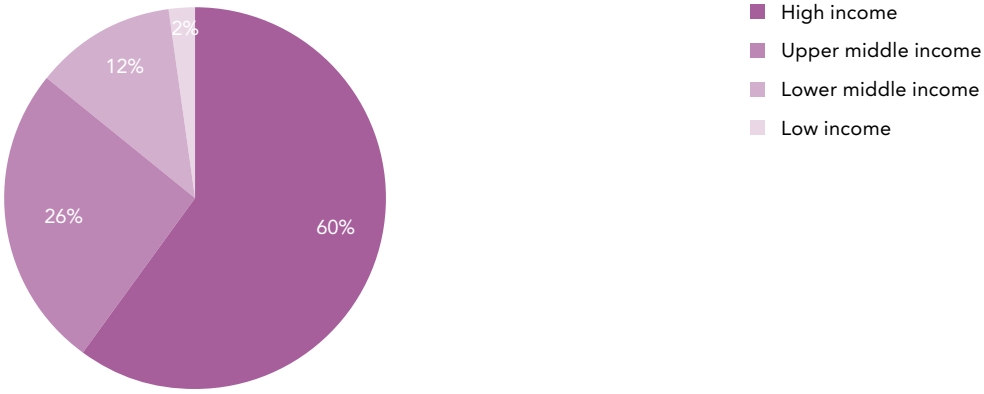
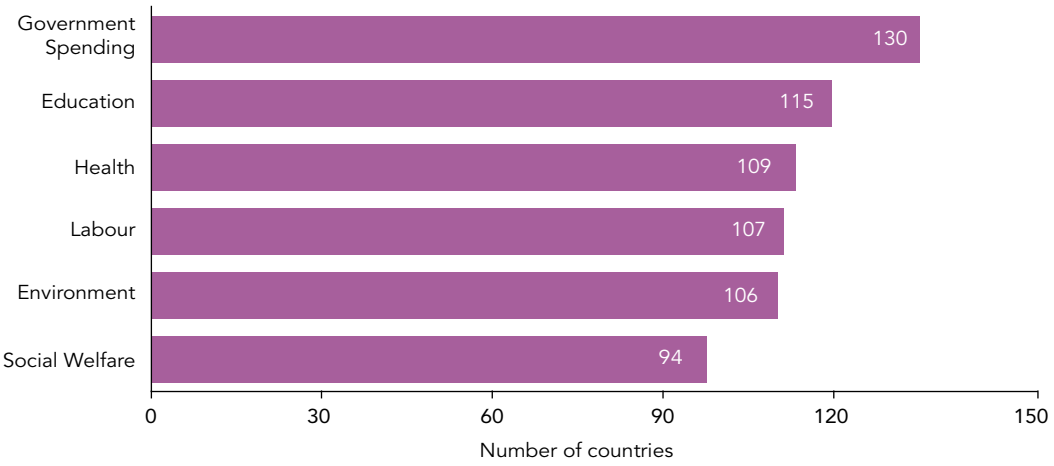


Figure 8.1b. Countries with a score higher than 66.6 per cent, by income level



data, 109 on health, 107 on labour, 106 on the environment and 94 on social welfare. In addition, the Survey noted that 97 out of 193 United Nations Member States have data specifically on disadvantaged and vulnerable groups. Sharing data on government spending was the most common data publishing activity undertaken by United Nations Member States. The advocacy of various non-governmental organizations in this area, such as OpenSpending,[3] which aims to track every government financial transaction across the World, or Open Budget Surveys,[4] a global research and advocacy programme promoting public access to budget information and the adoption of accountable budget systems, seems to contribute to this trend.

Figure 8.2. Number of countries offering data, by sector



The *Survey* then assessed whether government data is made available in a form that ensures ease of use and reuse. Indicators of accessibility included presence of a dedicated data portal, availability of guidelines on how to make use of datasets, existence of a feedback mechanism to propose new datasets and technical openness of datasets (i.e. availability of datasets in various formats including in machine-readable structured formats, or non-proprietary formats like CSV instead of excel), open standards and availability of Application Programming Interfaces (APIs) to access the published data.

While a large number of United Nations Member States provided sectoral data, only 46 of these have taken the next step and established dedicated portals for data sharing, as seen in Figure 8.3. In Europe, 44 per cent of countries (or 19 countries) have dedicated open data portals as compared to 7.4 per cent in Africa. Kenya, Tunisia, Morocco and Ghana are the only African countries with an open government data portal. The majority of countries with open government data catalogues are high income and upper middle income (nearly 85 per cent). Kenya is the only low income country with an OGD portal; the lower middle income countries with such portals are India, Sri Lanka, Morocco, Republic of Moldova, Ghana and Indonesia.

The utility, quality and accessibility of information depend on the format used for data publishing. Processing and analysing data through software programs

(technical openness) requires open standards and open file formats exploring, sorting, filtering and recombining data. Technical data standards allow policy makers to compare datasets and generate the creation of relevant data. When data becomes more accessible, more people can engage in and benefit from data analysis which, in turn, can contribute to better policymaking. The 2014 *Survey* checked the availability of various data types in different formats and noted that 86 countries provide data in machine-readable structured data (e.g. Excel), 56 in non-proprietary formats (e.g. CSV), 24 countries provide Application Programming Interfaces (APIs) and only 11 countries provide data in open standards from W3C such as RDF and SPARQL (see Figure 8.4).

Figure 8.3. Countries with OGD portals, by region

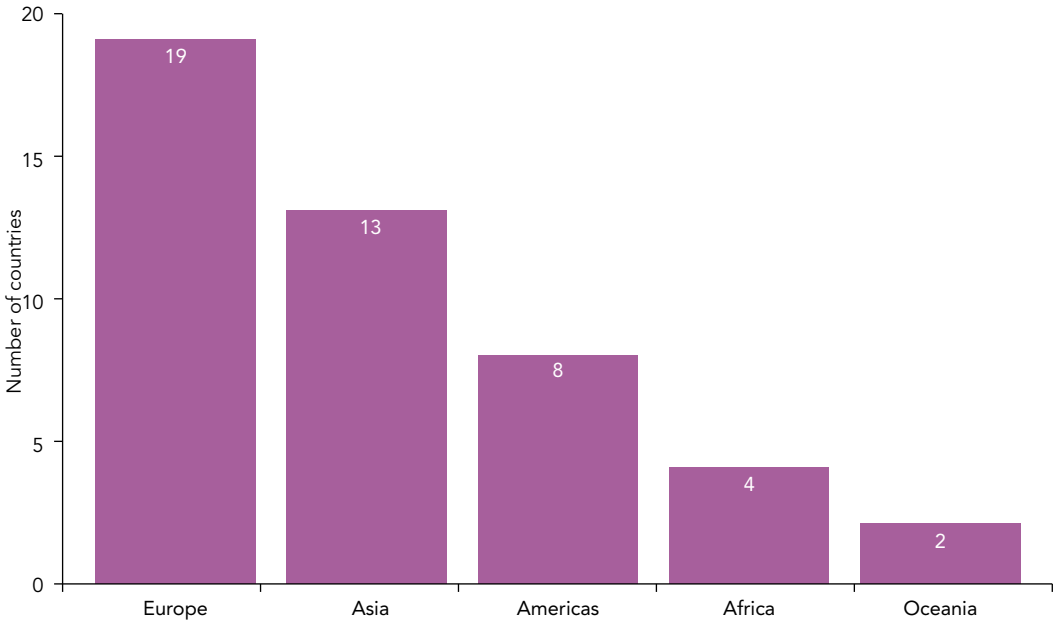
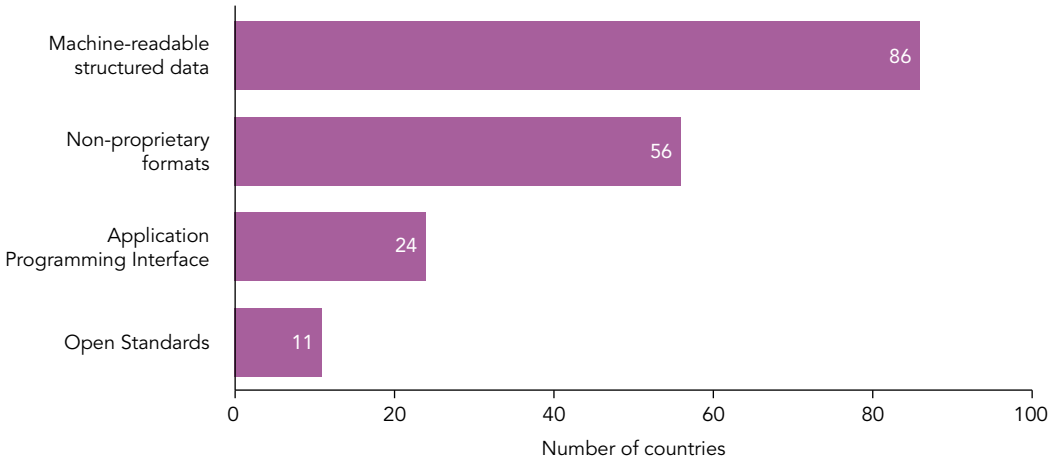


Figure 8.4. Availability of data types in different formats



Government agencies can increase the benefits of OGD initiatives by providing detailed descriptions of data fields as well as tools and guidelines for how to analyze and make use of the datasets. In 2014, 34 countries offered this type of instructional information. For example, the open data portal of Kenya has a section specifically for developers where it lists the tools designed to access and integrate the data. In the same section, developers can also learn more about upcoming events like workshops on utilizing government data and get information on the APIs used to provide access to the data.

Following a demand-driven approach into publishing datasets can help ensure that governments meet their citizens' needs. Governments can collect feedback on which datasets to publish by surveying citizens and other potential users, like civil society organizations, academic institutions or businesses. While individual citizens may want information useful for their daily lives, civil society groups would likely be more interested in data to help them hold governments accountable or data that can be used for advocacy. Businesses by contrast demand high-quality raw data to create value-added products and services. The 2014 *Survey* noted that 31 of the countries with a dedicated data portal have a section in their portals to receive inputs on the data types to be published.

Box 8.1. Bahrain open government data portal

The open data platform of Bahrain is an important initiative for the country as it aims to implement a public data hub and a strategy for open data to enable transparency, promote e-participation and inspire innovation. The primary role of the platform is to publish datasets from ministries and government agencies in an open format and making this data available to the public. The platform enables the public to have a central point of access to find, download and use datasets generated by the ministries and governmental entities in the country. The public benefits from the data provided in different ways, as gaining access to government data helps the public in acquiring a better understanding of how the government works. It also allows the general public and businesses to use the data for research, creating reports, provide feedback, develop web and smart phone applications and solutions based on public data. With the platform, the government pursues to expand the portfolio of the e-Government services by extending the growing efforts to the private sector, enhancing transparency and allowing people for creativity.

Source: http://www.data.gov.bh/

Providing datasets in bulk, with open standards and an open license, eases the job of data analysis and increases participation in policymaking. Providing datasets as they are, however, is already beneficial for transparency, participation and efficiency. The 2014 *Survey* scored Ireland, El Salvador, Luxembourg, Peru, Qatar, Georgia, Latvia, Lithuania, Thailand and Argentina higher than 66.6 per cent in data publishing, even though those countries do not have dedicated open government data portals. Researchers, nevertheless, were able to access many relevant databases across portals. This implies that they already have policies in place for centralizing and digitizing data and that they are ready to take the

next step: publish data in bulk and in open formats through dedicated portals. Greece, Malta, Ghana, Slovakia and Indonesia, conversely, have open government data catalogues but did not score higher than 66.6 per cent in data publishing, suggesting these portals should include a wider range of government agencies and more varied datasets in machine-readable formats.

8.2.2. Policy, legal and institutional frameworks for Open Government Data

Freedom of information legislation is essential for the development of Open Government Data. The foundations of OGD lie in the people's right to information, as enshrined in article 19 of the Universal Declaration of Human Rights and as recognized by the international community. The multilateral system, including the United Nations and other regional organisations, has addressed the right to information, commonly referred to as Freedom of Information (FOI), extensively through international treaties, conventions and other sources of international law. Domestic laws in about 93 Member States have addressed the subject through specific legislation (e.g. FOI acts, Access to Information Acts, etc.). 35 countries only have a FOI article in their constitutions—24 have relevant draft legislation. Meanwhile, 41 countries have no FOI legislation at all.

Privacy of personal information as well as confidentiality in national security matters need to be protected when publishing government data for public access and use. Preliminary research by UNDESA[5] found that 79 countries have addressed data privacy and security through specific legislation, usually called Data Protection Acts (DPAs). 15 only have data privacy and security provisions in their constitutions, six have relevant draft legislation and three countries cover data privacy in their access to information laws. 90 countries have no legislation on this at all.

Very few countries have passed or even drafted legislation requiring government data to be published in machine-readable formats with open licenses. Among the few recent initiatives taken by various national governments, in August 2011 New Zealand approved comprehensive general principles for data management[6] drawing from several aspects of the 8 Principles for Open Government Data.[7] These state that government data and information should be open, readily available, well managed, reasonably priced and re-usable, unless there are necessary reasons for its protection. The amendment made to the European Union (EU) Directive 2003/98/EC in June 2013 introduces a genuine right to reuse all content that can be accessed under national laws and invites Member State to make more documents available in machine-readable and open formats. The Republic of Korea enacted a law in July 2013 requiring government agencies to publish data in machine-readable formats.[8] An executive order in May 2013 by the United States of America,[9] which makes the open and machine-readable format the new default for government information, declared that information is a national asset whose value is multiplied when made easily accessible to the public. The Russian Federation's Government Order No. 583 of 10 July 2013 set out the rules for classifying public sector information as open data, the timeframe for updating this information, as well as other requirements concerning the publication of information as open data.[10]

Data is considered open when it is shared with an open license in a way that permits commercial and non-commercial use and reuse without restrictions. While the 2014 Survey did not assess the licenses in depth, a quick review of the data catalogues revealed that licenses vary from strict, with clear copyright statements, to less strict. The Creative Commons Attribution 3.0 License[11] is one of the most common license types, used, for instance, in Australia, Austria, Chile, Germany, Italy, New Zealand and Uruguay. Countries such as Albania, Bahrain, Morocco, Netherlands and Tunisia use a common adaptation of the Open Knowledge Foundation's Open Database License. In Austria in particular, cooperation between federal and local governments has led to the endorsement of a Creative Commons Attribution License for government data. Alliances such as these bring together federal, state and city governments, as well as local communities, to forge common standards and develop conditions in which OGDs can benefit all stakeholders.

An overview of the data catalogues reveals a variety of agencies and ministries responsible for open government data initiatives across countries: the Department of Finance and Deregulation in Australia,[12] the Federal Ministry of Finance in Austria,[13] and the Ministry of Finance and the Accountant General in Israel,[14] to name a few. In some countries, like Colombia[15] and Ghana,[16] the initiative is undertaken by the Ministry of Information and Communication Technologies. In others, there is cooperation between agencies, as with the Ministry of Finance and Infocomm Development Authority in Singapore,[17] and the Ministry of Finance and Public Administration and Ministry of Industry, Energy and Tourism in Spain.[18] Finally, in a few countries—France, the United Kingdom and the United States of America—a specific unit under the executive branch is engaged, like France's Etalab.[19]

While there are different agencies responsible for open government data initiatives in different countries, one common need within government agencies is having an individual responsible for institution-wide control, governance and utilization of data. This individual, usually called a Chief Data Officer (CDO), would also be responsible for the formation of new strategies around government data. It has already been noted that some governments, particularly at the local level, are moving towards having CDOs. For example in the United States of America, the Federal Communications Commission (FCC), has appointed CDOs at every one of its major bureaus including Consumer & Governmental Affairs, Enforcement and Public Safety and Homeland Security, to emphasize the importance of this role.[20] In a similar development, the newly enacted open data law by the City of San Francisco established the CDO position to implement the open data policy in cooperation with departmental data coordinators.[21] The CDO role is relatively new to government, although it has been common in the private sector since the early 21st century. Frequent changes in technology and advances in the types and formats of data available, as well as the emerging concept of transparency, are leading administrative institutions the world over to appoint Chief Data Officers at various levels.

Since open government data initiatives require cooperation among various government agencies, strong political and top level management support is needed. A vision should be complemented with a well-thought-out policy and strat-

egy. Countries that have progressed on open government data already have strong policies in place. For example, Bahrain's OGD policy aims to enhance public participation and private sector involvement by publishing datasets via their Open Government Data Portal, thereby allowing everyone to develop web and/or mobile applications that improve government transparency and public participation. The National Policy on Data Sharing and Accessibility (NPDSA)[22] of India aims at increating the accessibility and sharing of non-sensitive data among registered users, as well as the availability of this data for scientific, economic and social development purposes. The open data policy of the Obama Administration of the United States treats information as a valuable national resource and a strategic asset for the Federal Government, its partners and the public and further states that executive departments and agencies must manage information as an asset throughout its life cycle to promote openness and interoperability and properly safeguard systems and information.[23]

8.3. Opportunities and challenges

Open government data has the potential to improve decision-making on complex problems in government and increase transparency for a range of civil society as well as across government agencies. In addition, it can help governments improve the efficiency and effectiveness of their services by allowing the public to reuse and remix freely available data for any purpose, potentially leading to innovation, new services and thus to economic growth. However, it may also come with potential challenges and risks that policy makers need to be aware of.

8.3.1. Data for development

Readily available data on governments' efforts to fight poverty, achieve universal primary education, fight HIV and foster maternal health, raises citizens' awareness and helps them participate in and oversee government actions. This data, as provided by open data portals, gives the private sector opportunities to productively contribute to the development process. For example, data shared by the Liberian government will support donor-funded peacebuilding activities across the country and provide the government with information on the places, regions, projects and types of activities needed to make future decisions.[24] If this kind of project-level information were available in all areas where development goals face challenges, donors, host governments and civil society could more easily target, coordinate and evaluate development assistance.

Improving access to geographical information and geospatial data and building capacities to use scientific information in areas such as climate monitoring, land use planning, water management, disaster risk reduction, health and food security, will allow for more accurate environmental and social impact assessments and more informed decision-making at all levels. For example, in Cambodia, much of the data that is of great importance to smallholder farmers and rural populations—e.g. data related to agrarian structure, foreign investment, infrastructure development plans and their environmental implications—is generated and controlled by the government, donor agencies and private companies. Only a limited amount

of available information ever reaches the public's attention and is often difficult to access or systematically track. The open data portal, Open Development Cambodia,[25] unites disparate data collection efforts by individual groups advocating for social and environmental justice into a secure, coordinated network designed to strengthen their efficacy and make public previously inaccessible data in a politically neutral way. In another example, opening data nationally revealed some countries were being asked to pay up to 25 times more than their neighbours for the same pharmaceutical drugs. The findings enabled governments to put pressure on pharmaceutical companies to reduce prices.[26]

It is also important for governments and humanitarian organizations to standardize data sets before a crisis starts as stated in one of the reports of the United Nations Secretary-General. Then it will be possible to identify quickly, for example, the locations of key services like health centres or water sources. National and subnational authorities have a wealth of valuable data on the resources, infrastructures and capacities of their communities, but do not necessarily have mechanisms to enable the sharing of this information. Making this data available to partners and the public can help to drive better decision-making. For example, the Kenya Open Data Initiative[27] enables anyone to locate health facilities, while presenting broader developmental, demographic and statistical data that could be invaluable in a crisis. Adopting policies that improve the quality of data, facilitating the open exchange of information and implementing global best practices for the exchange of data, would further strengthen the coordination of emergency humanitarian assistance.

8.3.2. Readiness for Open Government Data

One key to a government's success in open government data is to assess the country's readiness to undertake such an initiative. Some international organizations have already led projects to assess country readiness for OGD initiatives. The Guidelines on Open Government Data for Citizen Engagement, developed by UNDESA, are a practical and easy-to-understand way for policy makers and technologists to design, implement and sustain open government data initiatives. Policy makers will find checklists on political commitment, capacity building, legislative, regulatory and institutional frameworks, cultural and human resources, financial conditions and technological infrastructure. The World Bank has also developed an 'Open Data Readiness Assessment' (ODRA) methodological tool for conducting an action-oriented assessment of the readiness of a government—or even an individual agency—to evaluate, design and implement an open data initiative. The tool assesses government readiness in various dimensions such as leadership, policy and legal framework, institutional structures, responsibilities and skills within government, data within government, demand for open data particularly for citizen engagement, open data ecosystems, financing and national technology and skills infrastructure. The Web Foundation, aiming to raise global awareness of the feasibility and benefits of open data in developing countries, has published readiness assessments for Ghana, Chile and Indonesia. The Foundation believes that initiatives should focus on releasing information that can be used to improve people's lives and should be structured to achieve an open govern-

ment paradigm shift that allows citizens to be better informed and more directly involved in political decision-making.

To have high-quality data in a government agency, systematic policies or legislation on the management of government information ought to be in place, like mandatory record keeping standards. Each agency must make and keep full and accurate records of its activities. These records must be authentic and have integrity and should be usable and in conformity with the standards and codes of best practice in the country. Each agency also needs to collect, store and manage information, ideally in digital form and through a standardized process. As such, there should be no irregularities in datasets; data should be consistent across agencies, complete, accurate and frequently updated. The power of data is often in the updating, not merely in baseline recording. Once these practices are in place, publishing data in OGD catalogues should be planned with the understanding of all agencies involved. Data publishing should not happen in an ad hoc manner without commonly agreed upon data and metadata standards and without the common identifiers which make finding, reusing, integrating and making sense of data from different sources. The interest and willingness to share data may be different across agencies. Raising awareness within the government and informing on the benefits of data sharing would be helpful in overcoming any potential reluctance. Once a data catalogue is established, the process must still be sustained, monitored and evaluated. Sharing data is important, but sharing updates to the data and keeping the data current is equally important.

In spite of the vast advantages of OGD, there are also potential downsides and risks. Some relate to privacy issues and data that can be personalized and misused against individuals or communities. The rights to privacy and to information are essential human rights in the modern information society. For the most part, they complement each other in holding governments accountable to individuals. There is the possibility of conflict between them, however, when access to government-held personal information is demanded. Governments need to develop mechanisms for identifying core issues to balance these two rights. A World Bank research paper[28] examines legislative and structural means to better define and harmonize the rights to privacy and information. Another concern pertains to national security. Governments can have a schema of classified data to exclude from their data catalogues. While developing OGD strategies, policymakers must keep in mind the safeguard of personal privacy and national security issues, especially because concern for these easily becomes a trigger for hiding data. Having an Information (Privacy) Commissioner, to whom citizens can relate their concerns, such as lack of access to certain data or the publishing of personal data, would also contribute to preventing conflicts in the OGD field. It is of paramount importance that these organizations be independent of the executive branch.

8.3.3. A sustainable Open Government Data ecosystem

Open Government Data has no value if the data published is not utilized. In order for OGD initiatives to thrive and develop, the stakeholders involved should actively promote and encourage opening more data, participation and the development of new applications. They should also foster an atmosphere of exchange

and collaboration among government agencies, citizens, civil society organizations and other stakeholders. Training and capacity-building of stakeholders and potential re-users should be given high priority in order to broaden the initiative. Policy makers cannot see open data as an end unto itself, but rather as a tool to reach further objectives. Engagement should be demand-driven and should take into consideration the views and requests of data users. The data should not only be clear but also provide information about metadata, frequency of updates and manuals for working with the data.

Engagement strategies should also promote conversations about the data, by allowing users to comment on datasets, for instance. Interaction among various stakeholders as well as participation of newcomers can be enhanced and facilitated by providing standard tools, how-to wikis, FAQs and discussion forums as well as capacity building workshops. A popular way of engaging with a community that reuses information and developing new applications is hosting competitions or hackathons. Most recently, many governments and international organizations interested in promoting open data have taken this approach. Table 8.3 lists some major initiatives. These events not only help capitalize on local talent and community buy-in, but also generate ideas that transform the nature of traditional public service channels.

Open Government Data is also one of the main drivers of data journalism. Datasets, critical thinking and thorough research provide context and depth to stories on complex issues. Specifically, data also helps journalists convey their stories through visually appealing and easy-to-follow graphs (usually called infographs).

Government data is already commonly used in journalism—for stories on themes as varied as the environment, crime and education. Some countries are responding in interesting ways when government data is underused. The Data Dredger project[29] in Kenya transforms government data into interactive sets and makes it more visually palatable, encouraging traditional media to embrace data-driven journalism. This journalistic practice can also open up more data: the Government of the Netherlands, for one, publicly releases every dataset and document solicited via access-to-information requests on a specific website. This website thus contains a trove of information available to everyone.[30]

Table 8.3. Examples of Open Government Data competitions

Finland	Apps for Finland	apps4finland.fi
Netherlands	Apps for the Netherlands	nationaleappprijs.nl
Australia	GovHack	govhack.org
Germany	Open Data Challenge	opendatachallenge.org/
Singapore	Ideas 4 Apps Challenge	ideas.data.gov.sg
Africa	Apps for Africa	apps4africa.org
Worldwide	Water Hackathon	water.worldbank.org
International	International Space Apps	spaceappschallenge.org
International	Apps for Climate	wbchallenge.imaginatik.com

Box 8.2. Promoting OGD usage in Moldova

One of the difficulties in launching open government data initiatives may lie in low public interest. Moldova is facing just such a problem.[31] Its citizens are not demanding disclosure of government data, in contrast with most other countries where government data was released under strong public pressure. Officials in Moldova supporting an open data initiative have held events to generate interest and awareness .around the issue, in addition to training sessions on data journalism and app development using open data. According to these officials, a Moldova-based NGO is working on a project called Budget Stories that would essentially release budgetary information in the form of infographics, creating visual stories behind the facts. In a separate initiative, a group of students in Moldova is combining different cartographic and geographic data to produce maps that will assist the government visualising certain domestic challenges.

Source: http://www.date.gov.md/

8.3.4. Return on investment

Open Government Data is providing new economic opportunities, both for public and private sectors, however it is too early to assess the full magnitude of its impact. Deloitte reported in a study[32] that open data will drive growth, ingenuity and innovation in the United Kingdom's economy, as organizations exploit the data in order to achieve sustainable growth, stronger performance and more meaningful engagement. In its study,[33] the consulting firm Cap Gemini concluded that governments are not sufficiently leveraging open data for economic benefits and recommended they follow the example set by Spain, which has over 150 companies focused on selling services on top of open government data. The Cap Gemini study also discusses how governments can save money through the transparency benefits OGD brings, as well as create jobs and develop skilled labour. It cites Australia's spatial information industry, which is based on open data and employs over 31,000 people. According to a study[34] conducted by the Research Institute of the Finnish Economy, firms in countries in which public sector agencies provide basic geographical information, either freely or at marginal cost, have grown on average about 15 percent more per annum than those in countries in which public sector geographical information is priced according to the cost-recovery principle. Another study reports that, when effectively deployed, an open data platform delivers at least a tenfold return on investment. In the beginning, the largest contributors to this return are in cost savings and internal efficiency gains.

Open government data initiatives is a concern since these initiatives need more time in order to be seen as essential public services. When the United States Government shut down in October 2013, its open data portal was inaccessible for days. The notice read that the site was down due to lapse in federal funding—yet other online services, like passport application on firstgov.gov, were up and running. Even before the shutdown, there had been reports of cutting funds for open government data platforms throughout the country.[35] This suggests that these portals could be the first affected in a crisis. It is all too easy for govern-

ment agencies to forget that they would operate more effectively and efficiently with oversight from the portals, resulting, in turn, in taxpayer savings. OGD, when implemented well, tracks taxpayers' money and provides them with tools to hold public officials more accountable. It increases data quality, including in the data collection and maintenance stages. It also facilitates data sharing among government agencies and results in increased internal efficiencies. The short-term cost of releasing and maintaining data catalogues is likely to be outweighed by the long-term benefits.

8.4. Conclusion

Data has always been a strategic asset, but its availability to the public has grown markedly in the last decade thanks to the precipitous advancement of technologies.

Opening up government data is fundamentally about more efficient use of resources and improving service delivery for citizens. The effects are potentially far-reaching for sustainable development: innovation, transparency, accountability, participatory governance and economic growth. The availability of data is paramount to the identification of development opportunities and policy decision-making. Better data can improve decision-making tremendously, but only where decision-makers favour policy that is evidence-based and context specific. The amount of data government agencies collect will grow exponentially in the coming years. Although open data provides many opportunities and capabilities for these agencies, its real impact will not be realised without carefully planned data management. A number of recommendations can be therefore extrapolated from the above conclusions:

- To stave off yet another development divide, in this case a data divide, it is important for countries to prioritize and invest in open government data initiatives.
- In order to grow and sustain open data initiatives, governments may want to consider updating their legal and institutional frameworks, as well as raising awareness at higher decision-making levels. Government agencies need to publish information proactively and be "open by default", rather than reactively disclose information in response to requests. In addition, existing regulations and laws can be reviewed to support open data initiatives and address privacy and security concerns. Information laws can be updated to specify new datasets to be published in open formats by all government agencies in a proactive way.
- Government agencies must have processes in place clearly defining which data to share with the public in which formats, at what time intervals and under which licenses, ensuring no restrictions on reuse of government information. In this context, not only policies but more importantly people, will make a difference in how the data is used to make governments more transparent, participatory and efficient.

- Countries undertaking open data initiatives need to closely monitor them to encourage usage, but also to improve internal processes. Policy makers aiming to benefit from open data can also foster an atmosphere of exchange and collaboration among government agencies, citizens, civil society organizations and other stakeholders.
- Training and capacity-building of stakeholders and potential re-users ought to be given high priority in order to broaden the impact of open data initiatives. It is also important to emphasize the quality of data—how well it has been collected and analyzed. Consequently, decisions regarding open government data may consider existing capacities in order to develop the appropriate knowledge, attitudes and skills necessary for data collection and analysis.

ANNEXES

Selected messages on ICT and public service delivery

General Debate, 68th Session of the United Nations General Assembly (September 2013)

A key enabler to foster growth is the bold use of modern ICT solutions.

Mr. Toomas Hendrik Ilves, President of Estonia

Using the "state of the art" digital technology, the people are today getting more than 200 services from 4,582 digitalized Union Services and Information Centres. Rural women are also getting health care services from digitally inter-connected 15,500 Community Health Clinics and Union Health Centres, which are reaching the health care services to the doorstep of the people. Advanced cell phone technologies are also providing services to over 100 million subscribers.

H.E. Mrs. Sheikh Hasina, Prime Minister, Bangladesh

In reforming and developing its information and communication technology infrastructure, Fiji has adopted a comprehensive approach by combining a national framework for ICT development with effective and pragmatic policies and initiatives to deliver results directly to the Fijian people.

H.E. Mr. Commodore Josaia V. Bainimarama, Prime Minister, Fiji

In India, we promote inclusive development in multiple ways … Digital technology is being harnessed to improve the delivery of public services and benefits to the people.

H.E. Mr. Manmohan Singh, Prime Minister, India

We are proud to acknowledge that the Government has embarked on a new course of technological modernization to enable direct public access to government services. Our

In this chapter:

aim is to make all such government services available electronically to all citizens by 2020 at any time, from anywhere, using modern communication technologies and devices such as computers, mobile phones and interactive payment offices. This kind of system will ensure real transparency in the relationship between citizens and public officials, combat corruption and reduce unnecessary bureaucracy.

H.E. Mr. Iurie Leancă, Prime Minister, Republic of Moldova

We are cognizant of the momentum and impact of information and communication technology as a tool that will assist in the development of the economy.

H.E. Mr. Denzil Douglas, Prime Minister, Saint Kitts and Nevis

Today, there are more than 20 million mobile phone users across Afghanistan, an increasing number of them accessing information and using various platforms on the internet.

H.E. Mr. Zalmai Rassoul, Minister of Foreign Affair, Afghanistan

One of the key elements that Azerbaijan is considering within the post-2015 agenda is information and communication technologies, which is a driving force of development and progress. To achieve the objective of ensuring improved access to ICTs, there is a need for intensified efforts towards enhancing regional synergies for promoting investment in ICT capacity building, refocusing tools and contents for addressing particular needs of the population and thus better deploying ICTs in the service of sustainable development. In this connection, Azerbaijan has put forward a proposal to establish the Eurasian Connectivity Alliance—a regional platform in support of improved connectivity and greater cooperation in the field of ICTs.

H.E. Mr. Elmar Maharram oglu Mammadyarov,
Minister of Foreign Affairs, Azerbaijan,

Science and knowledge are considered as common rights for all mankind and the tremendous advances and developments that have been made over the years in applying and using modern technologies have become essential tools of everyday life for human beings within their scientific and intellectual creations. From this point of view, my country worked with steady pace to keep up with the development of knowledge in response to current needs and in anticipation of the future.

H.E. Mr. Yousef Bin Al-Alawi Bin Abdulla, Minister of Foreign Affairs, Oman

Source: http://gadebate.un.org/

Regional and subregional classification

AFRICA
Eastern Africa
Burundi
Comoros
Djibouti
Eritrea
Ethiopia
Kenya
Madagascar
Malawi
Mauritius
Mozambique
Rwanda
Seychelles
Somalia
South Sudan
Uganda
United Republic of Tanzania
Zambia
Zimbabwe
Middle Africa
Angola
Cameroon
Central African Republic
Chad
Congo
Democratic Republic of the Congo
Equatorial Guinea
Gabon
Sao Tome and Principe
Northern Africa
Algeria
Egypt
Libya
Morocco
Sudan
Tunisia
Southern Africa
Botswana
Lesotho
Namibia
South Africa
Swaziland
Western Africa
Benin
Burkina Faso
Cape Verde
Côte d'Ivoire
Gambia
Ghana
Guinea
Guinea-Bissau
Liberia
Mali
Mauritania
Niger
Nigeria
Senegal
Sierra Leone
Togo

AMERICA
Caribbean
Antigua and Barbuda
Bahamas
Barbados
Cuba
Dominica
Dominican Republic
Grenada
Haiti
Jamaica
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Trinidad and Tobago
Central America
Belize
Costa Rica
El Salvador
Guatemala
Honduras
Mexico
Nicaragua
Panama
Northern America
Canada
United States of America
South America
Argentina
Bolivia (Plurinational State of)
Brazil
Chile
Colombia
Ecuador
Guyana
Paraguay
Peru
Suriname
Uruguay
Venezuela (Bolivarian Republic of)

ASIA
Central Asia
Kazakhstan
Kyrgyzstan
Tajikistan
Turkmenistan
Uzbekistan
Eastern Asia
China
Democratic People's Republic of Korea
Japan
Mongolia
Republic of Korea
South-Eastern Asia
Brunei Darussalam
Cambodia
Indonesia
Lao People's Democratic Republic
Malaysia
Myanmar
Philippines
Singapore
Thailand
Timor-Leste
Viet Nam
Southern Asia
Afghanistan
Bangladesh
Bhutan
India
Iran (Islamic Republic of)
Maldives
Nepal
Pakistan
Sri Lanka
Western Asia
Armenia
Azerbaijan
Bahrain
Cyprus
Georgia
Iraq
Israel
Jordan
Kuwait
Lebanon
Oman
Qatar
Saudi Arabia
Syrian Arab Republic
Turkey
United Arab Emirates
Yemen

ANNEX

EUROPE
Eastern Europe
Belarus
Bulgaria
Czech Republic
Hungary
Poland
Republic of Moldova
Romania
Russian Federation
Slovakia
Ukraine
Northern Europe
Denmark
Estonia
Finland
Iceland
Ireland
Latvia
Lithuania
Norway
Sweden
United Kingdom of Great Britain and Northern Ireland
Southern Europe
Albania
Andorra
Bosnia and Herzegovina
Croatia
Greece
Italy
Malta
Montenegro
Portugal
San Marino
Serbia
Slovenia
Spain
The former Yugoslav Republic of Macedonia
Western Europe
Austria
Belgium
France
Germany
Liechtenstein
Luxembourg
Monaco
Netherlands
Switzerland

OCEANIA
Australia and New Zealand
Australia
New Zealand
Melanesia
Fiji
Papua New Guinea
Solomon Islands
Vanuatu
Micronesia
Kiribati
Marshall Islands
Micronesia (Federated States of)
Nauru
Palau
Polynesia
Samoa
Tonga
Tuvalu

Survey Methodology

A.1. Introduction

Every two years, the United Nations Department of Economic and Social Affairs (UNDESA) through its Division for Public Administration and Development Management (DPADM) publishes the *United Nations E-Government Survey*. The *Survey* provides a snapshot with relative rankings of e-government development of all Member States of the United Nations.

By ranking the performance of countries on a relative scale, the *Survey* provides relevant information to support policy makers in shaping their e-government programmes for development. As a composite indicator, the e-government development index (EGDI) is used to measure the willingness and capacity of national administrations to use information and communication technologies to deliver public services. This measure of the index is useful for government officials, policy makers, researchers and representatives of civil society and the private sector to gain a deeper understanding of the comparative benchmarking of the relative position of a country in utilizing e-government for the delivery of inclusive, accountable and citizen-centric services.

The *Survey* provides insights of common themes and different strategies in development patterns among regions and across countries. By tracking the progress of countries globally over time, the *Survey* seeks to better understand the challenges that the United Nations Member States face in developing their e-government programmes. The challenges include (*a*) how to promote greater use of e-government while ensuring equal access to services; (*b*) how to leverage resources to integrate new technologies into traditional development patterns while ensuring that such opportunities are fully utilized; (*c*) how to devise appropriate e-government strategies and policies that can help to overcome inadequate human resources capabilities, infrastructure, as well as language and content. The *Survey* also highlights broad trends among countries and across regions. By providing better understanding of the emerging patterns of countries' performance across the world, the Survey contributes to the ongoing discussion of the critical role of ICT in development. The Survey also identifies countries and areas where the potential of ICT and e-government have not been yet fully exploited.

The EGDI is based on an expert assessment survey of the online presence of all 193 United Nations Member States, which assesses national websites and how e-government policies and strategies are applied in general and in specific sectors for delivery of essential services. The assessment rates the e-government performance of countries relative to one another as opposed to being an absolute measurement. The results are tabulated and combined with a set of indicators gauging a country's capacity to participate in the information society, without which e-government development efforts are of limited immediate use.

Although the basic model has remained consistent, the precise meaning of these values varies from one edition of the *Survey* to the next as understanding of the potential of e-government changes and the underlying technology evolves. This is an important distinction because it also implies that it is a comparative framework that seeks to encompass various approaches that may evolve over time instead of advocating a linear path with an absolute goal.

Mathematically, the EGDI is a weighted average of three normalized scores on three most important dimensions of e-government, namely: scope and quality of online services (Online Service Index, OSI), development status of telecommunication infrastructure (Telecommunication Infrastructure Index, TII) and inherent human capital (Human Capital Index, HCI). Each of these sets of indices is in itself a composite measure that can be extracted and analyzed independently.

$$EGDI = \frac{1}{3}\,(OSI_{normalized} + TII_{normalized} + HCI_{normalized})$$

Prior to the normalization of the three component indicators, the Z-score standardization procedure is implemented for each component indicator to ensure that the overall EGDI is equally decided by the three component indexes, i.e. each component index presents comparable variance subsequent to the Z-score standardization. In the absence of the Z-score standardization treatment, the EGDI would mainly depend on the component index with the greatest dispersion. After the Z-score standardization, the arithmetic average sum becomes a good statistical indicator, where "equal weights" truly means "equal importance."

For standard Z-score calculation of each component indicator:

$$x_{new} = \frac{x - \mu}{\sigma}$$

where:

x is a raw score to be standardized;

μ is the mean of the population;

σ is the standard deviation of the population.

The composite value of each component index is then normalized to fall between the range of 0 to 1 and the overall EGDI is derived by taking the arithmetic average of the three component indexes.

As indicated, the EGDI is used as a benchmark to provide a numerical ranking of e-government development across United Nations Member States, yet this approach has its own weaknesses.

The methodological framework for the United Nations E-Government Development Index has remained consistent across the *Survey* editions. At the same time, the *Survey* has been adjusted to reflect emerging trends of e-government strategies, evolving knowledge of best practices in e-government, changes in technology and other factors, and data collection practices have been periodically refined.

Figure A.1. The three components of the E-Government Development Index (EGDI)

A.2. Telecommunication Infrastructure Index (TII)

Research shows that every 10 point increase in broadband penetration increases economic growth rates, on average, by 1.38 per cent in low- and middle-income countries.[1] Ten years ago, there were only eight cell phones for every 100 people in the developing world while today there are almost 90,[2] opening opportunities for tens of millions of people who previously felt marginalised or isolated and unable to participate fully in society and engage with others. In this context, the influence of mobile broadband in the overall telecommunication infrastructure in any one nation is important.

Given the availability of suitable data,[3] a new wireless broadband subscription indicator was included in the computation of Telecommunication Infrastructure Index (TII) in the 2014 *Survey*. The TII is an arithmetic average composite of five indicators: estimated internet users per 100 inhabitants, number of main fixed telephone lines per 100 inhabitants, number of mobile subscribers per 100 inhabitants, number of wireless broadband subscriptions per 100 inhabitants and number of fixed broadband subscriptions per 100 inhabitants. The International Telecommunication Union is the primary source of data in each case.

The TII has remained largely unchanged since 2002, except for the replacement of online population with fixed-broadband subscription and the removal of number of television sets in 2008; the replacement of personal computer (PC) users with fixed Internet subscriptions in 2012; and the replacement of fixed Internet subscriptions with wireless broadband subscriptions in 2014.

The improvement of data quality and coverage has led to reduction in some data gaps that appeared in prior *Survey*s. However, in the case where gaps still occurred, data was retrieved firstly from the Word Bank data base; and secondly, when all previous measures proved unsuccessful, the most recent ITU data was used.

Each of these indicators was standardized via the Z-score procedure to derive the Z-score for each component indicator. The telecommunication infrastructure composite value for country "x" is the simple arithmetic mean of the five standardized indicators derived this way:

Figure A.2. Telecommunication Infrastructure Index (TII) and its components

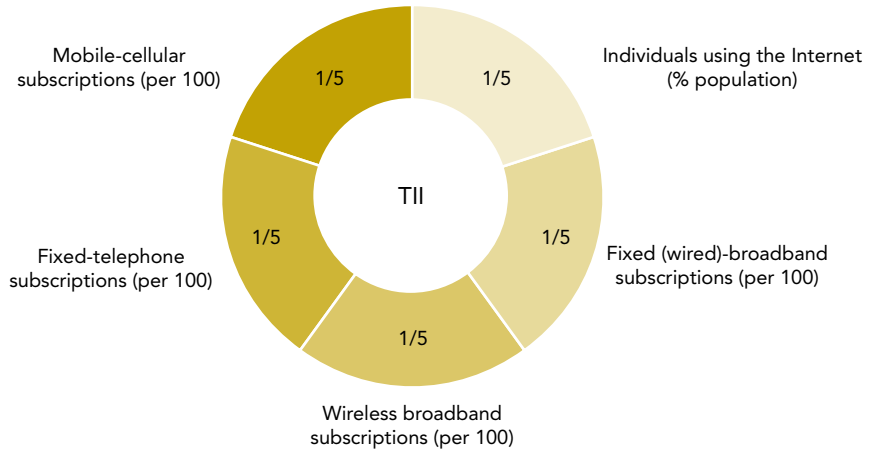


Table A.1. Telecommunication Infrastructure Index and changes of its components (*2003–2014*)

TII (2002)	*TII (2003)*	*TII (2004)*	*TII (2005)*	*TII (2008)*	*TII (2010)*	*TII (2012)*	*TII (2014)*
Internet users	Internet users	Internet users	Internet users	Internet users	Internet users	Internet users	Internet users
Online population	Online population	Online population	Online population	Fixed-broadband subscriptions	Fixed-broadband subscriptions	Fixed-broadband subscriptions	Fixed-broadband subscriptions
Personal computer (PC) users	Personal computer (PC) users	Personal computer (PC) users	Personal computer (PC) users	Personal computer (PC) users	Personal computer (PC) users	Fixed Internet subscriptions	Wireless broadband subscriptions
Fixed-telephone subscriptions	Fixed-telephone subscriptions	Fixed-telephone subscriptions	Fixed-telephone subscriptions	Fixed-telephone subscriptions	Fixed-telephone subscriptions	Fixed-telephone subscriptions	Fixed-telephone subscriptions
Mobile-cellular subscriptions	Mobile-cellular subscriptions	Mobile-cellular subscriptions	Mobile-cellular subscriptions	Mobile-cellular subscriptions	Mobile-cellular subscriptions	Mobile-cellular subscriptions	Mobile-cellular subscriptions
Television sets	Television sets	Television sets	Television sets	-	-	-	-

Telecommunication infrastructure composite value=

Arithmetic Mean (Internet user Z-score
+ Telephone line Z-score
+ Mobile subscription Z-score
+ Wireless broadband subscription Z-score
+ Fixed broadband Z-score)

Finally, the TII composite value is normalized by taking its value for a given country, subtracting the lowest composite value in the *Survey* and dividing by the range of composite values for all countries. For example, if country "x" has the composite value of 1.3813, and the lowest composite value for all countries is -1.1358 and the highest is 2.3640, then the normalized value of TII for country "x" would be:

$$\textit{Telecommunication Infrastructure Index (Country "x")} = \frac{[1.3813-(-1.1358)]}{[2.3640-(-1.1358)]} = 0.7192$$

A.3. Human Capital Index (HCI)

The 2014 Survey introduced two new components to the Human Capital Index (HCI), namely (i) expected years of schooling; and (ii) average years of schooling. A study was conducted to analyze the behaviour of the new HCI. The effects of introducing new components, i.e. the expected years of schooling and the mean years of schooling, were investigated and the impact was evaluated with particular attention on significant changes in the calculation of HCI. The preliminary statistical study commissioned by DPADM validated the use of the new HCI, accentuating that the two new components has strengthened the HCI and it does not introduce any error.

These were added to two existing components of adult literacy rate and the combined primary, secondary and tertiary gross enrolment ratio which had been used for the past Surveys since 2002. This addition also echoed the call of the United Nations Secretary-General's Report[4] "A life of dignity for all: accelerating progress towards the Millennium Development Goals and advancing the United Nations development agenda beyond 2015, transformative and mutually reinforcing actions to provide quality education and lifelong learning were highlighted, amongst others, as essential for development. It was stressed that young people should be able to receive high-quality education and learning, from early childhood development to post-primary schooling, including not only formal schooling but also life skills and vocational education and training.

The definitions of the four indicators of HCI are:

1. **Adult literacy** is measured as the percentage of people aged 15 years and above who can, with understanding, both read and write a short simple statement on their everyday life.

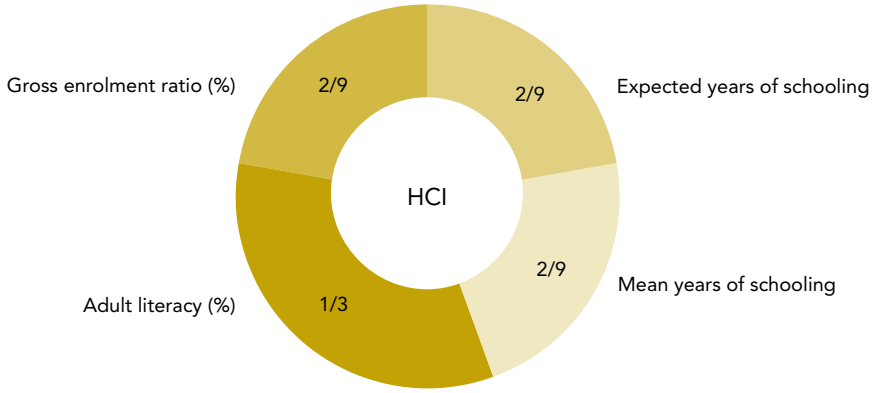
2. **Gross enrolment ratio** is measured as the combined primary, secondary and tertiary gross enrolment ratio, of the total number of students enrolled at the primary, secondary and tertiary level, regardless of age, as a percentage of the population of school age for that level.

3. **Expected years of schooling** is the total number of years of schooling which a child of a certain age can expect to receive in the future, assuming that the probability of his or her being in school at any particular age is equal to the current enrolment ratio age.[5]

4. **Mean years of schooling (MYS)** provides the average number of years of education completed by a a country's adult population (25 years and older), excluding the years spent repeating grades.[6]

The HCI is a weighted average composite of the four indicators. Similar to calculating the TII, each of the four component indicators is first standardized via the Z-score procedure to derive the Z-score value for each component indicator. The human capital composite value for country "x" is the weighted arithmetic mean with one-third weight assigned to adult literacy rate and two-ninth weight assigned to the gross enrolment ratio, estimate years of schooling and mean years of schooling derived this way:

Figure A.3. Human Capital Index (HCI) and its components



Human capital composite value =
1/3 x Adult literacy rate Z-score +
2/9 x Gross enrolment ratio Z-score +
2/9 x Expected years of schooling Z-score +
2/9 x Mean years of schooling Z-score

Then, the human capital composite value is normalized by taking its composite value for a given country, subtracting the lowest composite value in the *Survey* and dividing by the range of composite values for all countries. For example, if country "x" has the composite value at 0.8438, and the lowest composite value for all countries is –3.2354 and the highest equal to 1.2752, then the normalized value of the Human Capital Index for country "x" would be:

$$\textit{Human Capital Index (Country "x")} = \frac{[0.8438–(–3.2354)]}{[1.2752–(–3.2354)]} = 0.9044$$

Table A.2. Human Capital Index and changes of its components (2003–2014)

Components of HCI in past Surveys (2002, 2003, 2004, 2005, 2008, 2010, 2012)	*Components of HCI in 2014 Survey*
Adult literacy	Adult literacy
Gross enrolment ratio	Gross enrolment ratio
-	Expected years of schooling
-	Mean years of schooling

Missing data for mean years of schooling

For countries with missing data on the mean years of schooling (MYS) component the MYS is calculated by UNDP using UNESCO as a source and the 2010 Barro and Lee methodology.[7] This methodology makes at least five assumptions in determining the MYS estimate and it is based on the following steps:

- The other three components of the HCI, for all the nations, have been used as an input of a linkage cluster algorithm. The components of the HCI are all connected because they all refer to education and culture.

- It has been verified that these clusters are composed by countries with similar MYS values.
- The aim is to assign to nations with missing MYS value the average of the cluster they belong to.
- Tests have been applied to the results in order to verify the consistency of the results.

A.4. Online Service Index (OSI)

Taking into account the new and emerging trends since 2012 the 2014 *Survey* questionnaire was improved to encompass the new developments with a focus on:

- the rising importance of a whole-of government approach and integrated online service delivery;
- the use of e-government to provide information and services to citizens on environment related issues;
- e-infrastructure and its increasing role in bridging the digital divide, with a particular emphasis on the provision of effective online services for the inclusion of disadvantaged and vulnerable groups, such as the poor, the disabled, women, children and youth, the elderly, minorities, etc;
- the increasing emphasis on service usage, multichannel service delivery, 'open government data', e-procurement;
- the expansion of e-participation and mobile government.

The outcome was an enhanced Survey instrument with a wider range of point distributions reflecting differences in levels of e-government development among countries.

To arrive at a set of Online Service Index values, more than 90 researchers -qualified graduate students and volunteers from universities in the field of public administration—assessed each country's national website in the native language, including the national portal, e-services portal and e-participation portal, as well as the websites of the related ministries of education, labour, social services, health, finance and environment as applicable.

To ensure consistency of assessments, all the researchers were provided with a rigorous training by e-government and online service delivery experts, with years of experience in conducting the assessments. All the researchers were guided by a Data Team Coordinator who provided support and guidance throughout the assessment period. Researchers were instructed and trained to assume the mind-set of an average citizen user in assessing sites. Thus, responses were generally based on whether the relevant features could be found and accessed easily, not whether they in fact exist although hidden somewhere on the sites. While it is possible, although implausible, to search the sites meticulously for all content and features, this approach misses the key point that the average user needs to find information and features quickly and intuitively for a site to be "usable" with content readily discoverable by the intended beneficiaries.

The data collection and *Survey* research ran from May 2013 until the end of June 2013. Each country was assessed by at least two researchers who conducted the *Survey* in the country's national language in May-June. After the initial assessment, the evaluations by the two researchers on each country were compared and questions with discrepancies were reviewed again by the researchers. The third phase, from July to August, was the final review by the Data Team Coordinators who analyzed all the answers and, where needed, carried out further review and verification processes using multiple methods and sources before the scores were sent for approval by a senior researcher. Through this multilevel approach, all surveyed sites were thoroughly assessed by at least three people, one of whom has years of experience in assessing public sector online services and reviewed by one of the Data Team Coordinators.

Once the evaluation phase was completed, the statistics team produced the first draft of the OSI ranking. The data was extracted from the platform and the raw OSI scores were created. Rankings were compared with previous OSI scores, and any discrepancies were reviewed thoroughly.

The Survey questionnaire is organized in specific thematic sets of questions (subthemes) structured in four patterns corresponding to the four stages of e-government development (see Figure A.4). The patterns have been designed to provide a qualitative assessment within a rigorous quantitative methodology. Each question calls for a binary response. Every positive answer generates a new "more in depth question" inside and across the patterns. For the 2014 Survey questionnaire, the thematic subthemes identified are:

- Whole-of-government;
- Multichannel service delivery;
- Bridging the digital divide;
- Increasing usage;
- Open Government;
- E-participation.

The outcome is an enhanced quantitative *Survey* with a wider range of point distributions reflecting differences in levels of e-government development among countries.

The total number of points scored by each country is normalized to the range of 0 to 1. The online index value for a given country is equal to the actual total score less the lowest total score divided by the range of total score values for all countries. For example, if country "x" has a score of 114, and the lowest score of any country is 0 and the highest equal to 153, then the online services value for country "x" would be:

$$\textit{Online Service Index (Country "x")} = \frac{(114-0)}{(153-0)} = 0.7451$$

A.5. Challenges in reviewing a country's online presence

Selecting the appropriate site/URL at the national level

The United Nations Member States are sent an invitation to provide information regarding their website addresses (URL) for different government ministries and the national portal(s). Information was also requested with regards to URLs for open government data, e-participation and the designated authority in charge of e-government policies. 80 Member States returned this information, compared to 50 in 2012. All appropriate sites are then utilized during the verification process.

One of the essential decisions for researchers when undertaking this *Survey* is to identify the specific site(s) to review as the national government site for each country. Regardless of the sophistication of e-government in a specific country, the priority for users is to find a clear indication as to which of the many potentially available government sites could be deemed as the "official" national government site—in a sense, the gateway or starting point for national users. Not only is this fairly easy to do—a simple, clear statement at the chosen website is sufficient to start—but also an important step towards providing government information and services to the public in an integrated, usable and easy-to-find manner. Many countries have in fact engaged in the procedure of actually noting on their national site that it is their "official" Government site, or "Gateway to Government," or other such statement.

Yet not all countries provided the appropriate URLs. Thus, some discretion is exerted when deciding whether to use the country-provided websites. What is noteworthy in this *Survey* is that the researchers not only reviewed the national portals but also undertook exhaustive research on e-participation and open government data where applicable.

One dilemma facing researchers is that a number of countries provide more than one apparently legitimate national access point. While some have simply not yet consolidated their government entry points into a single site or portal that could be clearly distinguished, others have actually taken this approach on purpose—offering different access points to different audiences. Considering that the use of integrated portals or multi-portals is emerging as a trend in e-government strategies worldwide, researchers would select the integrated website as a National Portal or other portal if it were deemed to be the official homepage of the government. However, more than one site could be scored if they were clearly part of a tightly integrated "network" of national sites. It should be noted that for those countries for which more than one site was assessed, having more than one national entry is neither a disadvantage nor a benefit.

Some countries do not offer certain public services at the federal level, but rather at the sub-national or local level. No country is penalized for offering a service at the sub-national level as opposed to the federal level per se. In fact, when the issue arises researchers tend to be inclusive in assessing the matter as long as the information and/or service can be found from the national level.

A more difficult problem arises when not only a specific service is located at the local level but when the entire ministerial functions are altogether missing at the national level. If researchers are unable to locate a ministry as per the above described method, then the final step is to find out whether the country in question actually has such a ministry at the national level or whether the functions might be locally administered.

Integrated portal and multi-portal approaches

Some countries have adopted a different approach to their online e-government portal, through utilizing multiple websites for different topics. Hence, instead of centralizing all the e-services, e-participation and forms in one portal, they have been made available on separate websites for a more audience-targeted approach. Researchers made sure to examine all possible websites when making the assessment, through links or search engines, to cover all government websites where relative information can be found.

Even though the norm has been to follow a one-stop-shop type of service delivery and an integrated portal approach, countries who have used a decentralized approach have not been penalized in their score, and the assessment was conducted as though for a single portal.

For example, Finland has a website www.valtioneuvosto.fi which is the information portal of the Finnish Government, whereas the website www.suomi.fi is the e-service and public service information portal with also open government data. Information on e-participation is centralized on the websites www.kansalaisaloite.fi and otakantaa.fi. This approach of having several websites for different purposes (information, services, participation and open government data) is typical of several European countries.

Accessing websites in national official languages

The research team was fully equipped to handle the six official languages of the United Nations, namely Arabic, Chinese, English, French, Russian and Spanish. However, as in previous *Survey* cycles, the team went beyond this mandate and made an effort to review each website in the official language of the country or, where that was not possible, in another of the languages available on the site. Translators provided assistance as necessary so that possible errors based on language have been reduced to a minimum.

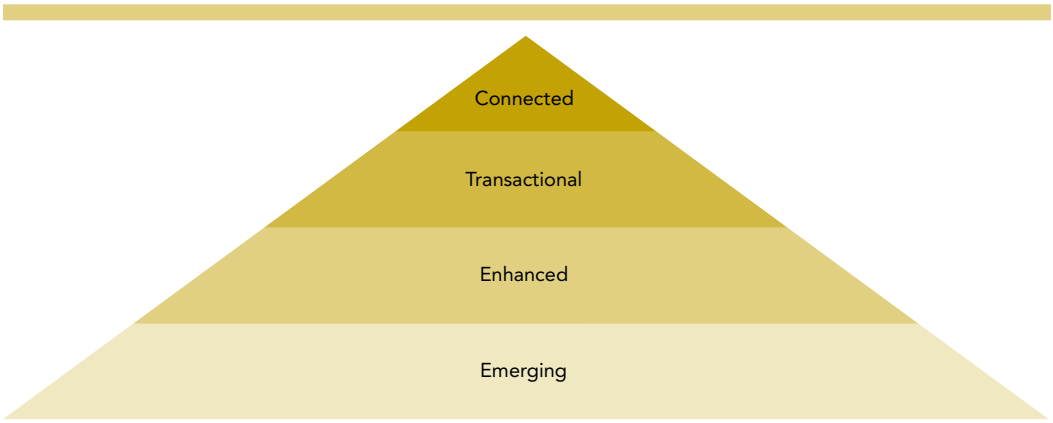
Data quality checks

In order to ensure the data quality, UNDESA has put Survey procedures under close monitoring including developing a standard web-based application platform for data collection and storage, preparing the methodological and training guidelines for researchers and instituting a training programme for either group training or individual hands-on support for researchers to resolve thorny issues. Among other tasks, team members were asked to justify the selection of URLs and indicate whether the URLs had been reviewed in past *Surveys*. Regular meetings were held to discuss concerns and ensure consistency of evaluation methods.

UNDESA applied the Survey scores to generate an ordering of online service presence of all United Nations Member States and compared them with the historical results in previous Surveys so as to detect possible shortcomings in the process. The new scores are then compared to scores from the previous Surveys by removing the new questions and only considering the ones that remain unchanged.

The team was assisted in the research by United Nations interns and volunteers with language skills not otherwise covered by the core group.

Figure A.4. The four stages of online service development



Stage 1 Emerging information services

Government websites provide information on public policy, governance, laws, regulations, relevant documentation and types of government services provided. They have links to ministries, departments and other branches of government. Citizens are able to obtain updated information in the national government and ministries and can follow links to archived information.

Stage 2 Enhanced information services

Government websites deliver enhanced one-way or simple two-way e-communication between government and citizen, such as downloadable forms for government services and applications. The sites have audio and video capabilities and are multi-lingual. Some limited e-services enable citizens to submit requests for non-electronic forms or personal information.

Stage 3 Transactional services

Government websites engage in two-way communication with their citizens, including requesting and receiving inputs on government policies, programmes, regulations, etc. Some form of electronic authentication of the citizen's identity is required to successfully complete the exchange. Government websites process non-financial transactions, e.g. filing taxes online or applying for certificates, licences and permits. They also handle financial transactions, i.e. where money is transferred on a secure network.

Stage 4 Connected services

Government websites have changed the way governments communicate with their citizens. They are proactive in requesting information and opinions from the citizens using Web 2.0 and other interactive tools. E-services and e-solutions cut across the departments and ministries in a seamless manner, information, data and knowledge is transferred from government agencies through integrated applications. Governments have moved from a government-centric to a citizen-centric approach, where e-services are targeted to citizens through life cycle events and segmented groups to provide tailor-made services. Governments create an environment that empowers citizens to be more involved with government activities to have a voice in decision-making.

Towards a more citizen-centric approach

In line with the global trend towards a more citizen-centric approach as driven by the demand for greater efficiency and cost-effectiveness of the public sector, the Survey questionnaire has been designed to reflect this paradigm of e-government. As mentioned above, user take-up has been included as one special subject in the Survey, which encourages the governments to take account not only of the supply side but also the demand side of e-services. Accordingly, the research team was instructed to enforce this approach consistently throughout the whole *Survey*. If features could not be found easily, quickly and intuitively, then a site would score poorly.

A.6. E-Participation Index (EPI)

The e-participation index (EPI) is derived as a supplementary index to the UN E-Government Survey. It extends the dimension of the Survey by focusing on the use of online services to facilitate provision of information by governments to citizens ("e-information sharing"), interaction with stakeholders ("e-consultation") and engagement in decision-making processes ("e-decision making"). (see Box A.1)

A country's EPI reflects on e-participation facilities that are deployed by the government as compared to all other countries. The purpose of this measure is not to prescribe any particular practice, but rather to offer insight into how different countries are using online tools to promote interaction between citizen and government, as well as among citizens, for the benefit of all. As the EPI is a qualitative assessment based on the availability and relevancy of participatory services available on government websites, the comparative ranking of countries is for illustrative purposes and should serve only as indicative of the broad trends in promoting citizen engagement. As with the EGDI, the EPI is not intended as absolute measurement of e-participation, but rather, it attempts to capture the e-participation performance of counties relative to one another at a particular point in time.

In the 2014 *Survey*, the e-participation questions were carefully reviewed and expanded to reflect current trends and modalities in how governments engage their citizens in public policy-making, implementation and evaluation. New questions were added to address data publishing and sharing by government agencies. Other features and updates were made included the availability of information on the citizens' rights to access government information, providing outcome on feedback received from citizens concerning the improvement of its online services, providing the tools in order to obtain public opinion for public policy deliberation through social media, online polls, petition tools, voting tools, online-bulletin boards and online discussion forums. While the EPI provides a useful qualitative analytical tool when comparing the data and ranking of countries for one particular year, caution must be taken in comparing e-participation rankings with past editions of the *Survey*.

Mathematically, the EPI is normalized by taking the total score value for a given country subtracting the lowest total score for any country in the *Survey* and dividing by the range of total score values for all countries. For example, if country "x"

has an e-participation score of 29, and the lowest value of any country is 0 and the highest equal to 38, then the normalized index value for country "x" would be:

$$\textit{E-Participation Index (Country "x")} = \frac{29-0}{38-0} = 0.7632$$

In 2014, the e-participation ranking of countries is determined by the value of EPI through the "standard competition ranking". In standard competition ranking, countries with the same EPI receive the same ranking number and a gap is left in the ranking numbers. This ranking strategy is adopted in view that if two or more countries tie for a position in the ranking, the positions of all those ranked below them are unaffected. For example, if country A ranks ahead of B and C, both of which share the same EPI value and scores ahead of D, then A is ranked first (1st), B and C are ranked second (2nd) and D is ranked fourth (4th). In 2012, the "modified competition ranking" was used and for comparison reasons, all ranks are adjusted using the standard competition ranking.

A.1. E-Participation Framework

- E-information: Enabling participation by providing citizens with public information and access to information without or upon demand
- E-consultation: Engaging citizens in contributions to and deliberation on public policies and services
- E-decision-making: Empowering citizens through co-design of policy options and co-production of service components and delivery modalities.

A.7. Country classifications and nomenclature in the Survey

Regional groupings are taken from the classification of the United Nations Statistics Division. For details, see http://unstats.un.org/unsd/methods/m49/m49regin.htm.

'There is no established convention for the designation of "developed" and "developing" countries or areas in the United Nations system. In common practice, Japan in Asia, Canada and the United States in northern America, Australia and New Zealand in Oceania and Europe are considered "developed" regions or areas. In international trade statistics, the Southern African Customs Union is also treated as a developed region and Israel as a developed country; countries emerging from the former Yugoslavia are treated as developing countries; and countries of Eastern Europe and of the Commonwealth of Independent States in Europe are not included under either developed or developing regions.'

Economies are divided according to 2012 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income, US $1,025 or less; lower middle income, US $1,026–US $4,035; upper middle income, US $4,036–US $12,475; and high income, US $12,476 or more.

For details, see http://data.worldbank.org/about/country-classifications.

This report uses the terminology 'developed' and 'developing' countries in line with the United Nations practice and keeping in mind the familiarity of the average reader with common usage. Wherever data and statistics are reported by income groups, the report classifies countries according to the World Bank income classification of high, middle and low income groups.

The lists of least developing countries, landlocked developing countries and small island developing countries were obtained from the United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS).

For details, see http://www.unohrlls.org/en/ldc/25/

A.8. United Nations e-government knowledge base

The Division for Public Administration and Development Management of the United Nations Department of Economic and Social Affairs is maintaining the United Nations e-government knowledge base (egovkb) to provide governments and all stakeholders an easy access to data and information on e-government development.

The egovkb is an interactive tool to view, sort and download information and datasets in open data formats from the 2014 UN E-Government Survey and previous editions (2003, 2004, 2005, 2008, 2010 and 2012). The egovkb also includes advanced research features such as customisable regional and country comparisons, rankings and country profiles.

For more information and details, see the United Nations e-Government Knowledge Base at http://unpan3.un.org/egovkb/"

Data tables

1. E-Government Development Index

Rank	*Country*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
173	Afghanistan	0.1900	0.1811	0.1472	0.2418
84	Albania	0.5046	0.4488	0.3548	0.7100
136	Algeria	0.3106	0.0787	0.1989	0.6543
43	Andorra	0.6426	0.4331	0.7671	0.7277
140	Angola	0.2970	0.2992	0.0978	0.4941
60	Antigua and Barbuda	0.5927	0.4173	0.5938	0.7669
46	Argentina	0.6306	0.5512	0.4835	0.8571
61	Armenia	0.5897	0.6142	0.3889	0.7660
2	Australia	0.9103	0.9291	0.8041	0.9978
20	Austria	0.7912	0.7480	0.7597	0.8660
68	Azerbaijan	0.5472	0.4331	0.4605	0.7480
92	Bahamas	0.4900	0.3386	0.4176	0.7138
18	Bahrain	0.8089	0.9370	0.7055	0.7840
148	Bangladesh	0.2757	0.3465	0.0941	0.3866
59	Barbados	0.5933	0.2205	0.6730	0.8865
55	Belarus	0.6053	0.3228	0.6069	0.8861
25	Belgium	0.7564	0.6772	0.6988	0.8932
120	Belize	0.3774	0.3780	0.1530	0.6012
180	Benin	0.1685	0.1102	0.1196	0.2756
143	Bhutan	0.2829	0.2441	0.1755	0.4290
103	Bolivia (Plurinational State of)	0.4562	0.3937	0.2324	0.7424
97	Bosnia and Herzegovina	0.4707	0.2835	0.3998	0.7288
112	Botswana	0.4198	0.3071	0.2969	0.6555
57	Brazil	0.6008	0.5984	0.4668	0.7372
86	Brunei Darussalam	0.5042	0.3622	0.3690	0.7815
73	Bulgaria	0.5421	0.2362	0.5941	0.7960
178	Burkina Faso	0.1804	0.2992	0.0842	0.1578
172	Burundi	0.1928	0.0157	0.0233	0.5393
139	Cambodia	0.2999	0.1732	0.2075	0.5189
144	Cameroon	0.2782	0.1969	0.0958	0.5421
11	Canada	0.8418	0.9134	0.7168	0.8952
127	Cape Verde	0.3551	0.1654	0.2966	0.6032
187	Central African Republic	0.1257	0.0394	0.0280	0.3099
189	Chad	0.1076	0.0472	0.0415	0.2341
33	Chile	0.7122	0.8189	0.4940	0.8236

ANNEX

1. E-Government Development Index (*continued*)

Rank	*Country*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
70	China	0.5450	0.6063	0.3554	0.6734
50	Colombia	0.6173	0.7874	0.3297	0.7348
177	Comoros	0.1808	0.0157	0.0604	0.4662
160	Congo	0.2570	0.1024	0.1453	0.5233
54	Costa Rica	0.6061	0.6142	0.4461	0.7582
171	Côte d'Ivoire	0.2039	0.1732	0.1392	0.2992
47	Croatia	0.6282	0.4646	0.6271	0.7928
116	Cuba	0.3917	0.2283	0.0969	0.8497
58	Cyprus	0.5958	0.4724	0.5320	0.7828
53	Czech Republic	0.6070	0.3701	0.5753	0.8755
149	Democratic People's Republic of Korea	0.2753	0.0079	0.0173	0.8007
183	Democratic Republic of the Congo	0.1551	0.0472	0.0337	0.3845
16	Denmark	0.8162	0.6614	0.8740	0.9132
184	Djibouti	0.1456	0.0630	0.0556	0.3182
110	Dominica	0.4338	0.1890	0.4424	0.6701
107	Dominican Republic	0.4481	0.3858	0.2945	0.6639
83	Ecuador	0.5053	0.4803	0.3318	0.7037
80	Egypt	0.5129	0.5906	0.3571	0.5912
88	El Salvador	0.4989	0.5354	0.3198	0.6414
168	Equatorial Guinea	0.2268	0.0315	0.1200	0.5288
192	Eritrea	0.0908	0.0000	0.0000	0.2723
15	Estonia	0.8180	0.7717	0.7934	0.8889
157	Ethiopia	0.2589	0.4567	0.0266	0.2934
85	Fiji	0.5044	0.3937	0.2872	0.8322
10	Finland	0.8449	0.7717	0.8594	0.9037
4	France	0.8938	1.0000	0.8003	0.8812
131	Gabon	0.3294	0.0945	0.2260	0.6677
167	Gambia	0.2285	0.2047	0.1482	0.3326
56	Georgia	0.6047	0.5984	0.4261	0.7895
21	Germany	0.7864	0.6693	0.8038	0.8862
123	Ghana	0.3735	0.3150	0.2444	0.5613
34	Greece	0.7118	0.6063	0.6549	0.8741
78	Grenada	0.5220	0.3465	0.4029	0.8166
133	Guatemala	0.3160	0.1496	0.2713	0.5272
190	Guinea	0.0954	0.0000	0.0504	0.2359
182	Guinea-Bissau	0.1609	0.0079	0.0878	0.3869
124	Guyana	0.3695	0.2441	0.2344	0.6301
176	Haiti	0.1809	0.1102	0.0952	0.3372
114	Honduras	0.4083	0.4016	0.1951	0.6281
39	Hungary	0.6637	0.5591	0.5654	0.8668

1. E-Government Development Index (*continued*)

Rank	*Country*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
19	Iceland	0.7970	0.6142	0.8591	0.9178
118	India	0.3834	0.5433	0.1372	0.4698
106	Indonesia	0.4487	0.3622	0.3054	0.6786
105	Iran (Islamic Republic of)	0.4508	0.3701	0.2940	0.6882
134	Iraq	0.3141	0.1969	0.2173	0.5283
22	Ireland	0.7810	0.6772	0.7039	0.9619
17	Israel	0.8162	0.8740	0.7200	0.8545
23	Italy	0.7593	0.7480	0.6747	0.8552
109	Jamaica	0.4388	0.3150	0.2753	0.7262
6	Japan	0.8874	0.9449	0.8553	0.8621
79	Jordan	0.5167	0.5197	0.3104	0.7202
28	Kazakhstan	0.7283	0.7480	0.5749	0.8619
119	Kenya	0.3805	0.4252	0.1612	0.5552
132	Kiribati	0.3201	0.2126	0.0665	0.6812
49	Kuwait	0.6268	0.5748	0.5862	0.7194
101	Kyrgyzstan	0.4657	0.2756	0.3801	0.7413
152	Lao People's Democratic Republic	0.2659	0.1417	0.1618	0.4941
31	Latvia	0.7178	0.7008	0.6237	0.8288
89	Lebanon	0.4982	0.3543	0.4030	0.7374
153	Lesotho	0.2629	0.1575	0.1179	0.5135
179	Liberia	0.1768	0.0787	0.0763	0.3754
121	Libya	0.3753	0.0157	0.3281	0.7821
35	Liechtenstein	0.6982	0.5118	0.7468	0.8361
29	Lithuania	0.7271	0.7559	0.5697	0.8557
24	Luxembourg	0.7591	0.6220	0.8723	0.7830
155	Madagascar	0.2606	0.2441	0.0488	0.4889
166	Malawi	0.2321	0.1732	0.0484	0.4746
52	Malaysia	0.6115	0.6772	0.4455	0.7119
94	Maldives	0.4813	0.3622	0.3952	0.6865
181	Mali	0.1634	0.1339	0.1350	0.2212
40	Malta	0.6518	0.4016	0.7683	0.7855
142	Marshall Islands	0.2851	0.1102	0.0448	0.7002
174	Mauritania	0.1893	0.0472	0.1626	0.3581
76	Mauritius	0.5338	0.4724	0.4406	0.6882
63	Mexico	0.5733	0.6614	0.3139	0.7445
130	Micronesia (Federated States of)	0.3337	0.1890	0.1099	0.7023
38	Monaco	0.6715	0.2205	1.0000	0.7940
65	Mongolia	0.5581	0.6142	0.2714	0.7887
45	Montenegro	0.6346	0.5276	0.5481	0.8279
82	Morocco	0.5060	0.6929	0.3350	0.4901

ANNEX

1. E-Government Development Index (*continued*)

Rank	*Country*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
164	Mozambique	0.2384	0.3150	0.0545	0.3457
175	Myanmar	0.1869	0.0236	0.0084	0.5288
117	Namibia	0.3880	0.3228	0.2719	0.5693
145	Nauru	0.2776	0.0551	0.2159	0.5617
165	Nepal	0.2344	0.1575	0.1684	0.3774
5	Netherlands	0.8897	0.9291	0.8175	0.9224
9	New Zealand	0.8644	0.8425	0.7506	1.0000
147	Nicaragua	0.2759	0.0945	0.1692	0.5639
191	Niger	0.0946	0.1260	0.0385	0.1192
141	Nigeria	0.2929	0.3071	0.1905	0.3811
13	Norway	0.8357	0.7559	0.8133	0.9380
48	Oman	0.6273	0.7323	0.4873	0.6624
158	Pakistan	0.2580	0.3228	0.1174	0.3337
108	Palau	0.4415	0.1654	0.3592	0.7999
77	Panama	0.5242	0.3701	0.4571	0.7455
188	Papua New Guinea	0.1203	0.0079	0.0530	0.3000
122	Paraguay	0.3740	0.2283	0.2236	0.6700
72	Peru	0.5435	0.6299	0.2718	0.7289
95	Philippines	0.4768	0.4803	0.2451	0.7051
42	Poland	0.6482	0.5433	0.5618	0.8396
37	Portugal	0.6900	0.6378	0.6094	0.8227
44	Qatar	0.6362	0.6535	0.5879	0.6671
1	Republic of Korea	0.9462	0.9764	0.9350	0.9273
66	Republic of Moldova	0.5571	0.5276	0.4236	0.7201
64	Romania	0.5632	0.4409	0.4385	0.8100
27	Russian Federation	0.7296	0.7087	0.6413	0.8388
125	Rwanda	0.3589	0.5118	0.0828	0.4820
90	Saint Kitts and Nevis	0.4980	0.1339	0.6321	0.7279
104	Saint Lucia	0.4525	0.2441	0.4000	0.7133
113	Saint Vincent and the Grenadines	0.4158	0.1575	0.3810	0.7088
111	Samoa	0.4204	0.2441	0.2672	0.7499
62	San Marino	0.5823	0.2756	0.6358	0.8354
169	Sao Tome and Principe	0.2218	0.0079	0.1398	0.5177
36	Saudi Arabia	0.6900	0.7717	0.5523	0.7461
151	Senegal	0.2666	0.3071	0.1644	0.3283
69	Serbia	0.5472	0.3937	0.4681	0.7796
81	Seychelles	0.5113	0.3307	0.4721	0.7310
186	Sierra Leone	0.1329	0.0472	0.0821	0.2692
3	Singapore	0.9076	0.9921	0.8793	0.8515
51	Slovakia	0.6148	0.4882	0.5296	0.8265

1. E-Government Development Index (*continued*)

Rank	*Country*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
41	Slovenia	0.6505	0.4252	0.6193	0.9072
170	Solomon Islands	0.2087	0.0551	0.1008	0.4702
193	Somalia	0.0139	0.0157	0.0259	0.0000
93	South Africa	0.4869	0.3858	0.3466	0.7282
185	South Sudan	0.1418	0.0079	0.0141	0.4035
12	Spain	0.8410	0.9449	0.6629	0.9152
74	Sri Lanka	0.5418	0.6535	0.2341	0.7376
154	Sudan	0.2606	0.2913	0.1847	0.3059
115	Suriname	0.4045	0.1417	0.3968	0.6749
138	Swaziland	0.3056	0.1339	0.1629	0.6200
14	Sweden	0.8225	0.7008	0.8866	0.8802
30	Switzerland	0.7267	0.5039	0.8199	0.8562
135	Syrian Arab Republic	0.3134	0.1575	0.1992	0.5835
129	Tajikistan	0.3395	0.0630	0.2306	0.7249
102	Thailand	0.4631	0.4409	0.2843	0.6640
96	The former Yugoslav Republic of Macedonia	0.4720	0.2441	0.4521	0.7198
161	Timor-Leste	0.2528	0.2047	0.0704	0.4831
162	Togo	0.2446	0.1102	0.0836	0.5401
98	Tonga	0.4706	0.3465	0.2348	0.8304
91	Trinidad and Tobago	0.4932	0.3307	0.4543	0.6945
75	Tunisia	0.5390	0.6378	0.3074	0.6717
71	Turkey	0.5443	0.5591	0.3605	0.7133
128	Turkmenistan	0.3511	0.0866	0.2189	0.7478
137	Tuvalu	0.3059	0.0394	0.1761	0.7022
156	Uganda	0.2593	0.1496	0.1011	0.5271
87	Ukraine	0.5032	0.2677	0.3802	0.8616
32	United Arab Emirates	0.7136	0.8819	0.5932	0.6657
8	United Kingdom of Great Britain and Northern Ireland	0.8695	0.8976	0.8534	0.8574
146	United Republic of Tanzania	0.2764	0.2992	0.0808	0.4492
7	United States of America	0.8748	0.9449	0.7406	0.9390
26	Uruguay	0.7420	0.8504	0.5607	0.8148
100	Uzbekistan	0.4695	0.4488	0.2333	0.7264
159	Vanuatu	0.2571	0.0787	0.1188	0.5736
67	Venezuela (Bolivarian Republic of)	0.5564	0.5512	0.3495	0.7685
99	Viet Nam	0.4705	0.4173	0.3792	0.6148
150	Yemen	0.2720	0.3071	0.1249	0.3840
163	Zambia	0.2389	0.1417	0.1247	0.4504
126	Zimbabwe	0.3585	0.3071	0.2238	0.5445

ANNEX

Regional and Economic Groupings

Country	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
Africa	0.2661	0.2011	0.1478	0.4492
Americas	0.5074	0.4216	0.3805	0.7202
Asia	0.4951	0.4652	0.3584	0.6615
Europe	0.6936	0.5695	0.6678	0.8434
Oceania	0.4086	0.2621	0.2564	0.7073
World	0.4712	0.3919	0.3650	0.6566

	EGDI	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
Small Island Developing States	0.4069	0.2520	0.3033	0.6654
Land Locked Developing Countries	0.3368	0.2710	0.2025	0.5368
Least Developed Countries	0.2121	0.1475	0.0929	0.3960

	EGDI	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
High Income	0.7207	0.6503	0.6845	0.8343
Upper Middle Income	0.4828	0.3709	0.3522	0.7253
Lower Middle Income	0.3523	0.3076	0.2307	0.5787
Low Income	0.2094	0.1523	0.0876	0.3884

2. E-Government Development Index by region—AFRICA

Rank	*Country*	*Sub-region*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
136	Algeria	Northern Africa	0.3106	0.0787	0.1989	0.6543
140	Angola	Middle Africa	0.2970	0.2992	0.0978	0.4941
180	Benin	Western Africa	0.1685	0.1102	0.1196	0.2756
112	Botswana	Southern Africa	0.4198	0.3071	0.2969	0.6555
178	Burkina Faso	Western Africa	0.1804	0.2992	0.0842	0.1578
172	Burundi	Eastern Africa	0.1928	0.0157	0.0233	0.5393
144	Cameroon	Middle Africa	0.2782	0.1969	0.0958	0.5421
127	Cape Verde	Western Africa	0.3551	0.1654	0.2966	0.6032
187	Central African Republic	Middle Africa	0.1257	0.0394	0.0280	0.3099
189	Chad	Middle Africa	0.1076	0.0472	0.0415	0.2341
177	Comoros	Eastern Africa	0.1808	0.0157	0.0604	0.4662
160	Congo	Middle Africa	0.2570	0.1024	0.1453	0.5233
171	Côte d'Ivoire	Western Africa	0.2039	0.1732	0.1392	0.2992
183	Democratic Republic of the Congo	Middle Africa	0.1551	0.0472	0.0337	0.3845
184	Djibouti	Eastern Africa	0.1456	0.0630	0.0556	0.3182
80	Egypt	Northern Africa	0.5129	0.5906	0.3571	0.5912
168	Equatorial Guinea	Middle Africa	0.2268	0.0315	0.1200	0.5288
192	Eritrea	Eastern Africa	0.0908	0.0000	0.0000	0.2723
157	Ethiopia	Eastern Africa	0.2589	0.4567	0.0266	0.2934
131	Gabon	Middle Africa	0.3294	0.0945	0.2260	0.6677
167	Gambia	Western Africa	0.2285	0.2047	0.1482	0.3326
123	Ghana	Western Africa	0.3735	0.3150	0.2444	0.5613
190	Guinea	Western Africa	0.0954	0.0000	0.0504	0.2359
182	Guinea-Bissau	Western Africa	0.1609	0.0079	0.0878	0.3869
119	Kenya	Eastern Africa	0.3805	0.4252	0.1612	0.5552
153	Lesotho	Southern Africa	0.2629	0.1575	0.1179	0.5135
179	Liberia	Western Africa	0.1768	0.0787	0.0763	0.3754
121	Libya	Northern Africa	0.3753	0.0157	0.3281	0.7821
155	Madagascar	Eastern Africa	0.2606	0.2441	0.0488	0.4889
166	Malawi	Eastern Africa	0.2321	0.1732	0.0484	0.4746
181	Mali	Western Africa	0.1634	0.1339	0.1350	0.2212
174	Mauritania	Western Africa	0.1893	0.0472	0.1626	0.3581
76	Mauritius	Eastern Africa	0.5338	0.4724	0.4406	0.6882
82	Morocco	Northern Africa	0.5060	0.6929	0.3350	0.4901
164	Mozambique	Eastern Africa	0.2384	0.3150	0.0545	0.3457
117	Namibia	Southern Africa	0.3880	0.3228	0.2719	0.5693
191	Niger	Western Africa	0.0946	0.1260	0.0385	0.1192
141	Nigeria	Western Africa	0.2929	0.3071	0.1905	0.3811

2. E-Government Development Index by region—AFRICA (*continued*)

Rank	*Country*	*Sub-region*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
125	Rwanda	Eastern Africa	0.3589	0.5118	0.0828	0.4820
169	Sao Tome and Principe	Middle Africa	0.2218	0.0079	0.1398	0.5177
151	Senegal	Western Africa	0.2666	0.3071	0.1644	0.3283
81	Seychelles	Eastern Africa	0.5113	0.3307	0.4721	0.7310
186	Sierra Leone	Western Africa	0.1329	0.0472	0.0821	0.2692
193	Somalia	Eastern Africa	0.0139	0.0157	0.0259	0.0000
93	South Africa	Southern Africa	0.4869	0.3858	0.3466	0.7282
185	South Sudan	Eastern Africa	0.1418	0.0079	0.0141	0.4035
154	Sudan	Northern Africa	0.2606	0.2913	0.1847	0.3059
138	Swaziland	Southern Africa	0.3056	0.1339	0.1629	0.6200
162	Togo	Western Africa	0.2446	0.1102	0.0836	0.5401
75	Tunisia	Northern Africa	0.5390	0.6378	0.3074	0.6717
156	Uganda	Eastern Africa	0.2593	0.1496	0.1011	0.5271
146	United Republic of Tanzania	Eastern Africa	0.2764	0.2992	0.0808	0.4492
163	Zambia	Eastern Africa	0.2389	0.1417	0.1247	0.4504
126	Zimbabwe	Eastern Africa	0.3585	0.3071	0.2238	0.5445

3. E-Government Development Index by region—AMERICAS

Rank	Country	Sub-region	EGDI	Online Service Component	Telecomm. Infrastructure Component	Human Capital Component
60	Antigua and Barbuda	Caribbean	0.5927	0.4173	0.5938	0.7669
46	Argentina	South America	0.6306	0.5512	0.4835	0.8571
92	Bahamas	Caribbean	0.4900	0.3386	0.4176	0.7138
59	Barbados	Caribbean	0.5933	0.2205	0.6730	0.8865
120	Belize	Central America	0.3774	0.3780	0.1530	0.6012
103	Bolivia (Plurinational State of)	South America	0.4562	0.3937	0.2324	0.7424
57	Brazil	South America	0.6008	0.5984	0.4668	0.7372
11	Canada	Northern America	0.8418	0.9134	0.7168	0.8952
33	Chile	South America	0.7122	0.8189	0.4940	0.8236
50	Colombia	South America	0.6173	0.7874	0.3297	0.7348
54	Costa Rica	Central America	0.6061	0.6142	0.4461	0.7582
116	Cuba	Caribbean	0.3917	0.2283	0.0969	0.8497
110	Dominica	Caribbean	0.4338	0.1890	0.4424	0.6701
107	Dominican Republic	Caribbean	0.4481	0.3858	0.2945	0.6639
83	Ecuador	South America	0.5053	0.4803	0.3318	0.7037
88	El Salvador	Central America	0.4989	0.5354	0.3198	0.6414
78	Grenada	Caribbean	0.5220	0.3465	0.4029	0.8166
133	Guatemala	Central America	0.3160	0.1496	0.2713	0.5272
124	Guyana	South America	0.3695	0.2441	0.2344	0.6301
176	Haiti	Caribbean	0.1809	0.1102	0.0952	0.3372
114	Honduras	Central America	0.4083	0.4016	0.1951	0.6281
109	Jamaica	Caribbean	0.4388	0.3150	0.2753	0.7262
63	Mexico	Central America	0.5733	0.6614	0.3139	0.7445
147	Nicaragua	Central America	0.2759	0.0945	0.1692	0.5639
77	Panama	Central America	0.5242	0.3701	0.4571	0.7455
122	Paraguay	South America	0.3740	0.2283	0.2236	0.6700
72	Peru	South America	0.5435	0.6299	0.2718	0.7289
90	Saint Kitts and Nevis	Caribbean	0.4980	0.1339	0.6321	0.7279
104	Saint Lucia	Caribbean	0.4525	0.2441	0.4000	0.7133
113	Saint Vincent and the Grenadines	Caribbean	0.4158	0.1575	0.3810	0.7088
115	Suriname	South America	0.4045	0.1417	0.3968	0.6749
91	Trinidad and Tobago	Caribbean	0.4932	0.3307	0.4543	0.6945
7	United States of America	Northern America	0.8748	0.9449	0.7406	0.9390
26	Uruguay	South America	0.7420	0.8504	0.5607	0.8148
67	Venezuela (Bolivarian Republic of)	South America	0.5564	0.5512	0.3495	0.7685

ANNEX

4. E-Government Development Index by region—ASIA

Rank	*Country*	*Sub-region*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
173	Afghanistan	Southern Asia	0.1900	0.1811	0.1472	0.2418
61	Armenia	Western Asia	0.5897	0.6142	0.3889	0.7660
68	Azerbaijan	Western Asia	0.5472	0.4331	0.4605	0.7480
18	Bahrain	Western Asia	0.8089	0.9370	0.7055	0.7840
148	Bangladesh	Southern Asia	0.2757	0.3465	0.0941	0.3866
143	Bhutan	Southern Asia	0.2829	0.2441	0.1755	0.4290
86	Brunei Darussalam	South-Eastern Asia	0.5042	0.3622	0.3690	0.7815
139	Cambodia	South-Eastern Asia	0.2999	0.1732	0.2075	0.5189
70	China	Eastern Asia	0.5450	0.6063	0.3554	0.6734
58	Cyprus	Western Asia	0.5958	0.4724	0.5320	0.7828
149	Democratic People's Republic of Korea	Eastern Asia	0.2753	0.0079	0.0173	0.8007
56	Georgia	Western Asia	0.6047	0.5984	0.4261	0.7895
118	India	Southern Asia	0.3834	0.5433	0.1372	0.4698
106	Indonesia	South-Eastern Asia	0.4487	0.3622	0.3054	0.6786
105	Iran (Islamic Republic of)	Southern Asia	0.4508	0.3701	0.2940	0.6882
134	Iraq	Western Asia	0.3141	0.1969	0.2173	0.5283
17	Israel	Western Asia	0.8162	0.8740	0.7200	0.8545
6	Japan	Eastern Asia	0.8874	0.9449	0.8553	0.8621
79	Jordan	Western Asia	0.5167	0.5197	0.3104	0.7202
28	Kazakhstan	Central Asia	0.7283	0.7480	0.5749	0.8619
49	Kuwait	Western Asia	0.6268	0.5748	0.5862	0.7194
101	Kyrgyzstan	Central Asia	0.4657	0.2756	0.3801	0.7413
152	Lao People's Democratic Republic	South-Eastern Asia	0.2659	0.1417	0.1618	0.4941
89	Lebanon	Western Asia	0.4982	0.3543	0.4030	0.7374
52	Malaysia	South-Eastern Asia	0.6115	0.6772	0.4455	0.7119
94	Maldives	Southern Asia	0.4813	0.3622	0.3952	0.6865
65	Mongolia	Eastern Asia	0.5581	0.6142	0.2714	0.7887
175	Myanmar	South-Eastern Asia	0.1869	0.0236	0.0084	0.5288
165	Nepal	Southern Asia	0.2344	0.1575	0.1684	0.3774
48	Oman	Western Asia	0.6273	0.7323	0.4873	0.6624
158	Pakistan	Southern Asia	0.2580	0.3228	0.1174	0.3337
95	Philippines	South-Eastern Asia	0.4768	0.4803	0.2451	0.7051
44	Qatar	Western Asia	0.6362	0.6535	0.5879	0.6671
1	Republic of Korea	Eastern Asia	0.9462	0.9764	0.9350	0.9273
36	Saudi Arabia	Western Asia	0.6900	0.7717	0.5523	0.7461
3	Singapore	South-Eastern Asia	0.9076	0.9921	0.8793	0.8515
74	Sri Lanka	Southern Asia	0.5418	0.6535	0.2341	0.7376

4. E-Government Development Index by region—ASIA (*continued*)

Rank	*Country*	*Sub-region*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
135	Syrian Arab Republic	Western Asia	0.3134	0.1575	0.1992	0.5835
129	Tajikistan	Central Asia	0.3395	0.0630	0.2306	0.7249
102	Thailand	South-Eastern Asia	0.4631	0.4409	0.2843	0.6640
161	Timor-Leste	South-Eastern Asia	0.2528	0.2047	0.0704	0.4831
71	Turkey	Western Asia	0.5443	0.5591	0.3605	0.7133
128	Turkmenistan	Central Asia	0.3511	0.0866	0.2189	0.7478
32	United Arab Emirates	Western Asia	0.7136	0.8819	0.5932	0.6657
100	Uzbekistan	Central Asia	0.4695	0.4488	0.2333	0.7264
99	Viet Nam	South-Eastern Asia	0.4705	0.4173	0.3792	0.6148
150	Yemen	Western Asia	0.2720	0.3071	0.1249	0.3840

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5. E-Government Development Index by region—EUROPE

Rank	Country	Sub-region	EGDI	Online Service Component	Telecomm. Infrastructure Component	Human Capital Component
84	Albania	Southern Europe	0.5046	0.4488	0.3548	0.7100
43	Andorra	Southern Europe	0.6426	0.4331	0.7671	0.7277
20	Austria	Western Europe	0.7912	0.7480	0.7597	0.8660
55	Belarus	Eastern Europe	0.6053	0.3228	0.6069	0.8861
25	Belgium	Western Europe	0.7564	0.6772	0.6988	0.8932
97	Bosnia and Herzegovina	Southern Europe	0.4707	0.2835	0.3998	0.7288
73	Bulgaria	Eastern Europe	0.5421	0.2362	0.5941	0.7960
47	Croatia	Southern Europe	0.6282	0.4646	0.6271	0.7928
53	Czech Republic	Eastern Europe	0.6070	0.3701	0.5753	0.8755
16	Denmark	Northern Europe	0.8162	0.6614	0.8740	0.9132
15	Estonia	Northern Europe	0.8180	0.7717	0.7934	0.8889
10	Finland	Northern Europe	0.8449	0.7717	0.8594	0.9037
4	France	Western Europe	0.8938	1.0000	0.8003	0.8812
21	Germany	Western Europe	0.7864	0.6693	0.8038	0.8862
34	Greece	Southern Europe	0.7118	0.6063	0.6549	0.8741
39	Hungary	Eastern Europe	0.6637	0.5591	0.5654	0.8668
19	Iceland	Northern Europe	0.7970	0.6142	0.8591	0.9178
22	Ireland	Northern Europe	0.7810	0.6772	0.7039	0.9619
23	Italy	Southern Europe	0.7593	0.7480	0.6747	0.8552
31	Latvia	Northern Europe	0.7178	0.7008	0.6237	0.8288
35	Liechtenstein	Western Europe	0.6982	0.5118	0.7468	0.8361
29	Lithuania	Northern Europe	0.7271	0.7559	0.5697	0.8557
24	Luxembourg	Western Europe	0.7591	0.6220	0.8723	0.7830
40	Malta	Southern Europe	0.6518	0.4016	0.7683	0.7855
38	Monaco	Western Europe	0.6715	0.2205	1.0000	0.7940
45	Montenegro	Southern Europe	0.6346	0.5276	0.5481	0.8279
5	Netherlands	Western Europe	0.8897	0.9291	0.8175	0.9224
13	Norway	Northern Europe	0.8357	0.7559	0.8133	0.9380
42	Poland	Eastern Europe	0.6482	0.5433	0.5618	0.8396
37	Portugal	Southern Europe	0.6900	0.6378	0.6094	0.8227
66	Republic of Moldova	Eastern Europe	0.5571	0.5276	0.4236	0.7201
64	Romania	Eastern Europe	0.5632	0.4409	0.4385	0.8100
27	Russian Federation	Eastern Europe	0.7296	0.7087	0.6413	0.8388
62	San Marino	Southern Europe	0.5823	0.2756	0.6358	0.8354
69	Serbia	Southern Europe	0.5472	0.3937	0.4681	0.7796
51	Slovakia	Eastern Europe	0.6148	0.4882	0.5296	0.8265
41	Slovenia	Southern Europe	0.6505	0.4252	0.6193	0.9072
12	Spain	Southern Europe	0.8410	0.9449	0.6629	0.9152

5. E-Government Development Index by region—EUROPE (*continued*)

Rank	*Country*	*Sub-region*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
14	Sweden	Northern Europe	0.8225	0.7008	0.8866	0.8802
30	Switzerland	Western Europe	0.7267	0.5039	0.8199	0.8562
96	The former Yugoslav Republic of Macedonia	Southern Europe	0.4720	0.2441	0.4521	0.7198
87	Ukraine	Eastern Europe	0.5032	0.2677	0.3802	0.8616
8	United Kingdom of Great Britain and Northern Ireland	Northern Europe	0.8695	0.8976	0.8534	0.8574

6. E-Government Development Index by region—OCEANIA

Rank	*Country*	*Sub-region*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
2	Australia	Australia and New Zealand	0.9103	0.9291	0.8041	0.9978
85	Fiji	Melanesia	0.5044	0.3937	0.2872	0.8322
132	Kiribati	Micronesia	0.3201	0.2126	0.0665	0.6812
142	Marshall Islands	Micronesia	0.2851	0.1102	0.0448	0.7002
130	Micronesia (Federated States of)	Micronesia	0.3337	0.1890	0.1099	0.7023
145	Nauru	Micronesia	0.2776	0.0551	0.2159	0.5617
9	New Zealand	Australia and New Zealand	0.8644	0.8425	0.7506	1.0000
108	Palau	Micronesia	0.4415	0.1654	0.3592	0.7999
188	Papua New Guinea	Melanesia	0.1203	0.0079	0.0530	0.3000
111	Samoa	Polynesia	0.4204	0.2441	0.2672	0.7499
170	Solomon Islands	Melanesia	0.2087	0.0551	0.1008	0.4702
98	Tonga	Polynesia	0.4706	0.3465	0.2348	0.8304
137	Tuvalu	Polynesia	0.3059	0.0394	0.1761	0.7022
159	Vanuatu	Melanesia	0.2571	0.0787	0.1188	0.5736

7. E-Government Development Index of Small Island Developing States

Rank	*Country*	*Sub-region*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
60	Antigua and Barbuda	Caribbean	0.5927	0.4173	0.5938	0.7669
92	Bahamas	Caribbean	0.4900	0.3386	0.4176	0.7138
18	Bahrain	Western Asia	0.8089	0.9370	0.7055	0.7840
59	Barbados	Caribbean	0.5933	0.2205	0.6730	0.8865
120	Belize	Central America	0.3774	0.3780	0.1530	0.6012
127	Cape Verde	West Africa	0.3551	0.1654	0.2966	0.6032
177	Comoros	Eastern Africa	0.1808	0.0157	0.0604	0.4662
116	Cuba	Caribbean	0.3917	0.2283	0.0969	0.8497
110	Dominica	Caribbean	0.4338	0.1890	0.4424	0.6701
107	Dominican Republic	Caribbean	0.4481	0.3858	0.2945	0.6639
85	Fiji	Melanesia	0.5044	0.3937	0.2872	0.8322
78	Grenada	Caribbean	0.5220	0.3465	0.4029	0.8166
182	Guinea-Bissau	West Africa	0.1609	0.0079	0.0878	0.3869
124	Guyana	South America	0.3695	0.2441	0.2344	0.6301
176	Haiti	Caribbean	0.1809	0.1102	0.0952	0.3372
109	Jamaica	Caribbean	0.4388	0.3150	0.2753	0.7262
132	Kiribati	Micronesia	0.3201	0.2126	0.0665	0.6812
94	Maldives	Southern Asia	0.4813	0.3622	0.3952	0.6865
142	Marshall Islands	Micronesia	0.2851	0.1102	0.0448	0.7002
76	Mauritius	Eastern Africa	0.5338	0.4724	0.4406	0.6882
130	Micronesia (Federated States of)	Micronesia	0.3337	0.1890	0.1099	0.7023
145	Nauru	Micronesia	0.2776	0.0551	0.2159	0.5617
108	Palau	Micronesia	0.4415	0.1654	0.3592	0.7999
188	Papua New Guinea	Melanesia	0.1203	0.0079	0.0530	0.3000
90	Saint Kitts and Nevis	Caribbean	0.4980	0.1339	0.6321	0.7279
104	Saint Lucia	Caribbean	0.4525	0.2441	0.4000	0.7133
113	Saint Vincent and the Grenadines	Caribbean	0.4158	0.1575	0.3810	0.7088
111	Samoa	Polynesia	0.4204	0.2441	0.2672	0.7499
169	Sao Tome and Principe	Middle Africa	0.2218	0.0079	0.1398	0.5177
81	Seychelles	Eastern Africa	0.5113	0.3307	0.4721	0.7310
3	Singapore	South-Eastern Asia	0.9076	0.9921	0.8793	0.8515
170	Solomon Islands	Melanesia	0.2087	0.0551	0.1008	0.4702
115	Suriname	South America	0.4045	0.1417	0.3968	0.6749
161	Timor-Leste	South-Eastern Asia	0.2528	0.2047	0.0704	0.4831
98	Tonga	Polynesia	0.4706	0.3465	0.2348	0.8304
91	Trinidad and Tobago	Caribbean	0.4932	0.3307	0.4543	0.6945
137	Tuvalu	Polynesia	0.3059	0.0394	0.1761	0.7022
159	Vanuatu	Melanesia	0.2571	0.0787	0.1188	0.5736

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8. E-Government Development Index of Landlocked Developing Countries

Rank	*Country*	*Sub-region*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
173	Afghanistan	Southern Asia	0.1900	0.1811	0.1472	0.2418
61	Armenia	Western Asia	0.5897	0.6142	0.3889	0.7660
68	Azerbaijan	Western Asia	0.5472	0.4331	0.4605	0.7480
143	Bhutan	Southern Asia	0.2829	0.2441	0.1755	0.4290
103	Bolivia (Plurinational State of)	South America	0.4562	0.3937	0.2324	0.7424
112	Botswana	Southern Africa	0.4198	0.3071	0.2969	0.6555
178	Burkina Faso	West Africa	0.1804	0.2992	0.0842	0.1578
172	Burundi	Eastern Africa	0.1928	0.0157	0.0233	0.5393
187	Central African Republic	Middle Africa	0.1257	0.0394	0.0280	0.3099
189	Chad	Middle Africa	0.1076	0.0472	0.0415	0.2341
157	Ethiopia	Eastern Africa	0.2589	0.4567	0.0266	0.2934
28	Kazakhstan	Central Asia	0.7283	0.7480	0.5749	0.8619
101	Kyrgyzstan	Central Asia	0.4657	0.2756	0.3801	0.7413
152	Lao People's Democratic Republic	South-Eastern Asia	0.2659	0.1417	0.1618	0.4941
153	Lesotho	Southern Africa	0.2629	0.1575	0.1179	0.5135
166	Malawi	Eastern Africa	0.2321	0.1732	0.0484	0.4746
181	Mali	West Africa	0.1634	0.1339	0.1350	0.2212
65	Mongolia	Eastern Asia	0.5581	0.6142	0.2714	0.7887
165	Nepal	Southern Asia	0.2344	0.1575	0.1684	0.3774
191	Niger	West Africa	0.0946	0.1260	0.0385	0.1192
122	Paraguay	South America	0.3740	0.2283	0.2236	0.6700
66	Republic of Moldova	Eastern Europe	0.5571	0.5276	0.4236	0.7201
125	Rwanda	Eastern Africa	0.3589	0.5118	0.0828	0.4820
138	Swaziland	Southern Africa	0.3056	0.1339	0.1629	0.6200
129	Tajikistan	Central Asia	0.3395	0.0630	0.2306	0.7249
96	The former Yugoslav Republic of Macedonia	Southern Europe	0.4720	0.2441	0.4521	0.7198
128	Turkmenistan	Central Asia	0.3511	0.0866	0.2189	0.7478
156	Uganda	Eastern Africa	0.2593	0.1496	0.1011	0.5271
100	Uzbekistan	Central Asia	0.4695	0.4488	0.2333	0.7264
163	Zambia	Eastern Africa	0.2389	0.1417	0.1247	0.4504
126	Zimbabwe	Eastern Africa	0.3585	0.3071	0.2238	0.5445

9. E-Government Development Index of Least Developed Countries

Rank	*Country*	*Sub-region*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
173	Afghanistan	Southern Asia	0.1900	0.1811	0.1472	0.2418
140	Angola	Middle Africa	0.2970	0.2992	0.0978	0.4941
148	Bangladesh	Southern Asia	0.2757	0.3465	0.0941	0.3866
180	Benin	West Africa	0.1685	0.1102	0.1196	0.2756
143	Bhutan	Southern Asia	0.2829	0.2441	0.1755	0.4290
178	Burkina Faso	West Africa	0.1804	0.2992	0.0842	0.1578
172	Burundi	Eastern Africa	0.1928	0.0157	0.0233	0.5393
139	Cambodia	South-Eastern Asia	0.2999	0.1732	0.2075	0.5189
187	Central African Republic	Middle Africa	0.1257	0.0394	0.0280	0.3099
189	Chad	Middle Africa	0.1076	0.0472	0.0415	0.2341
177	Comoros	Eastern Africa	0.1808	0.0157	0.0604	0.4662
183	Djibouti	Middle Africa	0.1456	0.0630	0.0556	0.3182
184	DR Congo	Eastern Africa	0.1551	0.0472	0.0337	0.3845
168	Equatorial Guinea	Middle Africa	0.2268	0.0315	0.1200	0.5288
192	Eritrea	Eastern Africa	0.0908	0.0000	0.0000	0.2723
157	Ethiopia	Eastern Africa	0.2589	0.4567	0.0266	0.2934
167	Gambia	West Africa	0.2285	0.2047	0.1482	0.3326
190	Guinea	West Africa	0.0954	0.0000	0.0504	0.2359
182	Guinea-Bissau	West Africa	0.1609	0.0079	0.0878	0.3869
176	Haiti	Caribbean	0.1809	0.1102	0.0952	0.3372
132	Kiribati	Micronesia	0.3201	0.2126	0.0665	0.6812
152	Lao People's Democratic Republic	South-Eastern Asia	0.2659	0.1417	0.1618	0.4941
153	Lesotho	Southern Africa	0.2629	0.1575	0.1179	0.5135
179	Liberia	West Africa	0.1768	0.0787	0.0763	0.3754
155	Madagascar	Eastern Africa	0.2606	0.2441	0.0488	0.4889
166	Malawi	Eastern Africa	0.2321	0.1732	0.0484	0.4746
181	Mali	West Africa	0.1634	0.1339	0.1350	0.2212
174	Mauritania	West Africa	0.1893	0.0472	0.1626	0.3581
164	Mozambique	Eastern Africa	0.2384	0.3150	0.0545	0.3457
175	Myanmar	South-Eastern Asia	0.1869	0.0236	0.0084	0.5288
165	Nepal	Southern Asia	0.2344	0.1575	0.1684	0.3774
191	Niger	West Africa	0.0946	0.1260	0.0385	0.1192
125	Rwanda	Eastern Africa	0.3589	0.5118	0.0828	0.4820
169	Sao Tome and Principe	Middle Africa	0.2218	0.0079	0.1398	0.5177
151	Senegal	West Africa	0.2666	0.3071	0.1644	0.3283
186	Sierra Leone	West Africa	0.1329	0.0472	0.0821	0.2692
170	Solomon Islands	Melanesia	0.2087	0.0551	0.1008	0.4702

9. E-Government Development Index of Least Developed Countries (*continued*)

Rank	*Country*	*Sub-region*	*EGDI*	*Online Service Component*	*Telecomm. Infrastructure Component*	*Human Capital Component*
193	Somalia	Eastern Africa	0.0139	0.0157	0.0259	0.0000
185	South Sudan	Eastern Africa	0.1418	0.0079	0.0141	0.4035
154	Sudan	Northern Africa	0.2606	0.2913	0.1847	0.3059
161	Timor-Leste	South-Eastern Asia	0.2528	0.2047	0.0704	0.4831
162	Togo	West Africa	0.2446	0.1102	0.0836	0.5401
137	Tuvalu	Polynesia	0.3059	0.0394	0.1761	0.7022
156	Uganda	Eastern Africa	0.2593	0.1496	0.1011	0.5271
146	United Republic of Tanzania	Eastern Africa	0.2764	0.2992	0.0808	0.4492
159	Vanuatu	Melanesia	0.2571	0.0787	0.1188	0.5736
150	Yemen	Western Asia	0.2720	0.3071	0.1249	0.3840
163	Zambia	Eastern Africa	0.2389	0.1417	0.1247	0.4504

10. Online Service Index and its components

Country	OSI	Stage 1	Stage 2	Stage 3	Stage 4	Total
		percentage				
Afghanistan	0.1811	38	23	5	18	20
Albania	0.4488	88	27	21	44	42
Algeria	0.0787	16	18	2	9	11
Andorra	0.4331	78	57	9	24	41
Angola	0.2992	59	50	0	12	29
Antigua and Barbuda	0.4173	78	41	16	29	39
Argentina	0.5512	91	66	26	24	50
Armenia	0.6142	94	61	33	41	56
Australia	0.9291	100	75	88	65	82
Austria	0.7480	100	75	51	44	67
Azerbaijan	0.4331	81	36	28	24	41
Bahamas	0.3386	53	34	14	35	33
Bahrain	0.9370	94	80	84	74	82
Bangladesh	0.3465	75	34	14	18	33
Barbados	0.2205	41	20	12	24	23
Belarus	0.3228	81	16	14	26	31
Belgium	0.6772	94	64	42	50	61
Belize	0.3780	66	50	16	15	36
Benin	0.1102	47	7	2	6	14
Bhutan	0.2441	69	23	2	15	25
Bolivia (Plurinational State of)	0.3937	69	39	16	32	37
Bosnia and Herzegovina	0.2835	56	41	7	12	28
Botswana	0.3071	72	36	5	15	30
Brazil	0.5984	100	68	28	26	54
Brunei Darussalam	0.3622	34	39	28	38	35
Bulgaria	0.2362	59	30	0	15	24
Burkina Faso	0.2992	38	41	9	32	29
Burundi	0.0157	19	7	0	0	6
Cambodia	0.1732	50	18	5	9	19
Cameroon	0.1969	47	25	7	9	21
Canada	0.9134	100	73	84	68	80
Cape Verde	0.1654	34	16	12	15	18
Central African Republic	0.0394	13	11	5	3	8
Chad	0.0472	19	11	5	0	8
Chile	0.8189	100	57	70	71	73
China	0.6063	100	57	37	32	55
Colombia	0.7874	88	75	56	65	70
Comoros	0.0157	19	7	0	0	6
Congo	0.1024	22	16	9	6	13

10. Online Service Index and its components (*continued*)

Country	OSI	Stage 1	Stage 2	Stage 3	Stage 4	Total
		percentage				
Costa Rica	0.6142	94	55	37	44	56
Côte d'Ivoire	0.1732	38	25	5	12	19
Croatia	0.4646	59	68	26	18	43
Cuba	0.2283	69	18	7	9	24
Cyprus	0.4724	59	43	37	38	44
Czech Republic	0.3701	53	45	23	21	35
Democratic People's Republic of Korea	0.0079	9	7	2	3	5
Democratic Republic of the Congo	0.0472	25	5	2	6	8
Denmark	0.6614	97	70	33	44	59
Djibouti	0.0630	25	7	0	12	10
Dominica	0.1890	38	30	9	6	20
Dominican Republic	0.3858	53	50	21	24	37
Ecuador	0.4803	88	52	19	26	44
Egypt	0.5906	81	52	33	56	54
El Salvador	0.5354	94	55	30	24	49
Equatorial Guinea	0.0315	9	14	0	6	7
Eritrea	0.0000	9	9	0	0	5
Estonia	0.7717	100	66	56	59	69
Ethiopia	0.4567	53	48	28	44	42
Fiji	0.3937	75	36	21	24	37
Finland	0.7717	100	70	47	65	69
France	1.0000	100	73	91	91	88
Gabon	0.0945	31	16	2	3	12
Gambia	0.2047	56	23	2	12	22
Georgia	0.5984	91	57	44	29	54
Germany	0.6693	97	68	47	32	60
Ghana	0.3150	78	18	19	18	31
Greece	0.6063	81	59	42	41	55
Grenada	0.3465	75	41	7	18	33
Guatemala	0.1496	25	27	9	6	17
Guinea	0.0000	9	7	0	3	5
Guinea-Bissau	0.0079	9	7	2	3	5
Guyana	0.2441	63	30	5	9	25
Haiti	0.1102	28	16	2	12	14
Honduras	0.4016	59	48	26	21	38
Hungary	0.5591	88	70	37	9	51
Iceland	0.6142	84	57	49	35	56
India	0.5433	97	59	21	29	50
Indonesia	0.3622	69	34	9	35	35

10. Online Service Index and its components (*continued*)

Country	OSI	Stage 1	Stage 2	Stage 3	Stage 4	Total
		percentage				
Iran (Islamic Republic of)	0.3701	59	48	19	18	35
Iraq	0.1969	41	25	5	18	21
Ireland	0.6772	91	64	42	53	61
Israel	0.8740	97	73	88	50	77
Italy	0.7480	97	66	51	59	67
Jamaica	0.3150	53	36	21	15	31
Japan	0.9449	97	73	79	88	83
Jordan	0.5197	91	41	21	50	48
Kazakhstan	0.7480	94	45	77	56	67
Kenya	0.4252	94	32	23	21	40
Kiribati	0.2126	44	27	12	9	22
Kuwait	0.5748	84	52	37	41	52
Kyrgyzstan	0.2756	81	27	2	9	27
Lao People's Democratic Republic	0.1417	50	14	2	6	16
Latvia	0.7008	91	66	47	53	63
Lebanon	0.3543	66	41	14	21	34
Lesotho	0.1575	44	16	2	15	18
Liberia	0.0787	19	11	7	9	11
Libya	0.0157	9	11	2	0	6
Liechtenstein	0.5118	56	61	33	38	47
Lithuania	0.7559	94	70	49	62	67
Luxembourg	0.6220	94	59	42	35	56
Madagascar	0.2441	75	18	5	12	25
Malawi	0.1732	63	14	0	9	19
Malaysia	0.6772	84	73	40	50	61
Maldives	0.3622	66	48	14	15	35
Mali	0.1339	47	14	0	9	16
Malta	0.4016	88	43	14	15	38
Marshall Islands	0.1102	47	14	0	0	14
Mauritania	0.0472	25	7	0	6	8
Mauritius	0.4724	88	64	9	21	44
Mexico	0.6614	97	73	40	32	59
Micronesia (Federated States of)	0.1890	56	23	2	6	20
Monaco	0.2205	16	45	14	12	23
Mongolia	0.6142	88	57	42	41	56
Montenegro	0.5276	84	68	12	35	48
Morocco	0.6929	94	61	40	62	62
Mozambique	0.3150	69	41	5	15	31
Myanmar	0.0236	13	11	0	3	7

10. Online Service Index and its components (*continued*)

Country	OSI	Stage 1	Stage 2	Stage 3	Stage 4	Total
		percentage				
Namibia	0.3228	69	32	14	18	31
Nauru	0.0551	22	11	2	3	9
Nepal	0.1575	59	11	2	6	18
Netherlands	0.9291	100	75	70	88	82
New Zealand	0.8425	97	66	84	53	75
Nicaragua	0.0945	16	14	16	3	12
Niger	0.1260	47	14	0	6	15
Nigeria	0.3071	56	36	14	18	30
Norway	0.7559	97	77	44	56	67
Oman	0.7323	97	64	60	44	65
Pakistan	0.3228	78	25	14	18	31
Palau	0.1654	53	16	2	9	18
Panama	0.3701	84	36	12	18	35
Papua New Guinea	0.0079	9	11	0	0	5
Paraguay	0.2283	59	25	2	15	24
Peru	0.6299	88	55	51	38	57
Philippines	0.4803	84	57	19	24	44
Poland	0.5433	72	59	42	26	50
Portugal	0.6378	100	55	40	44	58
Qatar	0.6535	91	61	42	47	59
Republic of Korea	0.9764	100	82	77	88	86
Republic of Moldova	0.5276	88	55	26	32	48
Romania	0.4409	78	45	19	29	41
Russian Federation	0.7087	91	77	51	35	63
Rwanda	0.5118	78	64	19	32	47
Saint Kitts and Nevis	0.1339	34	18	2	12	16
Saint Lucia	0.2441	44	32	14	12	25
Saint Vincent and the Grenadines	0.1575	50	16	2	9	18
Samoa	0.2441	75	20	0	15	25
San Marino	0.2756	56	39	5	15	27
Sao Tome and Principe	0.0079	6	14	0	0	5
Saudi Arabia	0.7717	94	68	63	53	69
Senegal	0.3071	78	32	5	15	30
Serbia	0.3937	72	52	12	18	37
Seychelles	0.3307	53	30	7	47	32
Sierra Leone	0.0472	13	16	5	0	8
Singapore	0.9921	100	89	88	71	87
Slovakia	0.4882	84	50	16	38	45
Slovenia	0.4252	63	64	7	29	40

10. Online Service Index and its components (*continued*)

Country	OSI	Stage 1	Stage 2	Stage 3	Stage 4	Total
		percentage				
Solomon Islands	0.0551	19	14	2	3	9
Somalia	0.0157	6	16	0	0	6
South Africa	0.3858	75	43	12	24	37
South Sudan	0.0079	16	5	2	0	5
Spain	0.9449	100	93	70	71	83
Sri Lanka	0.6535	88	73	28	53	59
Sudan	0.2913	66	20	2	38	29
Suriname	0.1417	50	14	0	9	16
Swaziland	0.1339	50	16	0	3	16
Sweden	0.7008	91	70	44	50	63
Switzerland	0.5039	56	66	21	44	46
Syrian Arab Republic	0.1575	19	7	12	38	18
Tajikistan	0.0630	31	7	2	3	10
Thailand	0.4409	94	34	14	35	41
The former Yugoslav Republic of Macedonia	0.2441	50	34	5	15	25
Timor-Leste	0.2047	47	25	7	12	22
Togo	0.1102	41	16	2	0	14
Tonga	0.3465	69	41	12	18	33
Trinidad and Tobago	0.3307	63	41	7	24	32
Tunisia	0.6378	91	61	33	53	58
Turkey	0.5591	81	57	23	50	51
Turkmenistan	0.0866	34	11	0	6	12
Tuvalu	0.0394	25	9	0	0	8
Uganda	0.1496	25	25	5	15	17
Ukraine	0.2677	75	20	5	18	27
United Arab Emirates	0.8819	100	77	67	71	78
United Kingdom of Great Britain and Northern Ireland	0.8976	100	73	63	88	79
United Republic of Tanzania	0.2992	81	32	2	12	29
United States of America	0.9449	100	68	77	94	83
Uruguay	0.8504	94	70	72	68	75
Uzbekistan	0.4488	88	41	23	24	42
Vanuatu	0.0787	34	5	5	6	11
Venezuela (Bolivarian Republic of)	0.5512	88	55	33	32	50
Viet Nam	0.4173	78	50	16	18	39
Yemen	0.3071	66	18	12	35	30
Zambia	0.1417	47	16	0	9	16
Zimbabwe	0.3071	88	25	5	15	30

ANNEX

Regional and Economic Grouping

Country	OSI	Stage 1	Stage 2	Stage 3	Stage 4	Total
		percentage				
Africa	0.2011	45.14	23.61	6.80	14.05	21.27
Americas	0.4216	68.21	42.73	24.52	27.56	39.57
Asia	0.4652	72.27	43.71	28.90	33.23	43.19
Europe	0.5695	81.32	58.25	33.32	39.26	51.85
Oceania	0.2621	51.79	26.30	16.45	14.92	26.33
World	0.3919	64.48	39.88	22.00	26.85	37.11

Country	OSI	Stage 1	Stage 2	Stage 3	Stage 4	Total
		percentage				
Small Island Developing States	0.2520	50.00	28.71	11.51	15/94	25.49
Land Locked developing Countries	0.2710	57.16	27.93	11.25	17.65	27.07
Least Developed Countries	0.1475	38.93	20.27	4.07	10.17	17.37

Country	OSI	Stage 1	Stage 2	Stage 3	Stage 4	Total
		percentage				
High Income	0.6503	82.10	61.49	46.13	48.29	58.55
Upper Middle Income	0.3709	67.75	39.94	16.78	22.48	35.36
Lower Middle Income	0.3076	9.71	31.14	14.25	2.96	30.11
Low Income	0.1523	39.64	18.70	5.05	9.58	17.22

11. Telecommunication Infrastructure Index and its components

Country	TII	Percentage of Individuals using the Internet	Fixed-telephone subscriptions per 100 inhabitants	Mobile-cellular telephone subscriptions per 100 inhabitants	Fixed (wired)-broadband subscriptions per 100 inhabitants	Wireless broadband subscriptions per 100 inhabitants
Afghanistan	0.1472	5.45	0.05	60.35	0.00*	28.73
Albania	0.3548	54.66	9.87	110.69	5.06	18.79
Algeria	0.1989	15.23	8.32	97.95	2.89	0.00
Andorra	0.7671	86.43	49.77	82.95	34.58	66.75
Angola	0.0978	16.94	1.46	47.07	0.15	1.50
Antigua & Barbuda	0.5938	59.00	39.30	201.83	5.73	20.21
Argentina	0.4835	55.80	24.33	142.62	10.89	20.86
Armenia	0.3889	39.16	19.68	111.91	6.95	29.09
Australia	0.8041	82.35	45.43	105.59	24.91	102.07
Austria	0.7597	81.00	39.49	160.54	25.13	56.10
Azerbaijan	0.4605	54.20	18.62	108.77	13.97	34.84
Bahamas	0.4176	71.75	36.83	68.29	2.61	24.52
Bahrain	0.7055	88.00	22.01	161.17	13.14	78.42
Bangladesh	0.0941	6.30	0.62	62.82	0.33	0.47
Barbados	0.6730	73.33	50.84	122.52	23.09	36.01
Belarus	0.6069	46.91	46.86	113.52	26.91	33.28
Belgium	0.6988	82.00	41.87	116.45	33.27	33.01
Belize	0.1530	25.00	7.84	50.65	3.08	0.52
Benin	0.1196	3.80	1.56	83.65	0.05	0.37
Bhutan	0.1755	25.43	3.64	75.61	2.26	2.52
Bolivia (Plurinational State of)	0.2324	34.19	8.39	90.45	1.05	6.62
Bosnia and Herzegovina	0.3998	65.36	22.91	87.44	10.54	12.07
Botswana	0.2969	11.50	8.01	153.79	0.80	17.80
Brazil	0.4668	49.85	22.30	125.00	9.15	37.22
Brunei Darussalam	0.3690	60.27	17.21	113.95	4.81	7.62
Bulgaria	0.5941	55.15	30.95	148.13	17.94	42.11
Burkina Faso	0.0842	3.73	0.86	60.61	0.09	0.00
Burundi	0.0233	1.22	0.18	22.81	0.00	0.00
Cambodia	0.2075	4.94	3.93	128.53	0.20	6.73
Cameroon	0.0958	5.70	3.40	60.41	0.01	0.00
Canada	0.7168	86.77	51.70	75.39	32.74	49.80
Cape Verde	0.2966	34.74	14.20	86.03	3.86	23.03
Central African Republic	0.0280	3.00	0.12	23.65	0.00	0.01
Chad	0.0415	2.10	0.24	33.73	0.16	0.00
Chile	0.4940	61.42	18.76	138.17	12.41	27.96
China	0.3554	42.30	20.25	79.88	12.75	16.95
Colombia	0.3297	48.98	13.19	102.85	8.33	5.05
Comoros	0.0604	5.98	3.34	34.84	0.03	0.00
Congo	0.1453	6.11	0.34	98.76	0.01	2.11

11. Telecommunication Infrastructure Index and its components (*continued*)

Country	*TII*	*Percentage of Individuals using the Internet*	*Fixed-telephone subscriptions per 100 inhabitants*	*Mobile-cellular telephone subscriptions per 100 inhabitants*	*Fixed (wired)-broadband subscriptions per 100 inhabitants*	*Wireless broadband subscriptions per 100 inhabitants*
Costa Rica	0.4461	47.50	21.18	128.01	10.02	27.66
Côte d'Ivoire	0.1392	2.38	1.35	99.93	0.25	0.00
Croatia	0.6271	63.00	38.07	115.41	20.67	53.90
Cuba	0.0969	25.64	10.79	14.92	0.04	0.00
Cyprus	0.5320	61.00	33.06	98.40	19.23	34.08
Czech Republic	0.5753	75.00	19.70	121.70	16.45	52.09
Demo. People's Republic of Korea	0.0173	0.00	4.77	6.87	0.00	1.82
Democratic Republic of Congo	0.0337	1.68	0.09	29.66	0.00	0.05
Denmark	0.8740	93.00	43.43	117.85	38.18	88.00
Djibouti	0.0556	8.27	2.09	24.31	1.85	0.00
Dominica	0.4424	55.18	20.34	152.47	11.86	0.00
Dominican Republic	0.2945	45.00	10.37	87.95	4.38	15.71
Ecuador	0.3318	35.13	14.90	106.23	5.20	21.62
Egypt	0.3571	44.07	10.60	119.92	2.83	27.93
El Salvador	0.3198	25.50	16.82	137.34	3.84	5.49
Equatorial Guinea	0.1200	13.94	2.02	68.05	0.20	0.00
Eritrea	0.0000	0.80	0.98	4.98	0.00	0.00
Estonia	0.7934	79.00	34.72	160.41	26.65	76.91
Ethiopia	0.0266	1.48	0.87	22.37	0.04	0.42
Fiji	0.2872	33.74	10.11	98.18	1.55	23.39
Finland	0.8594	91.00	16.46	172.32	30.42	106.41
France	0.8003	83.00	61.45	97.41	37.47	51.77
Gabon	0.2260	8.62	1.04	153.13	0.31	0.00
Gambia	0.1482	12.45	3.58	85.20	0.03	1.36
Georgia	0.4261	45.50	29.28	107.81	9.00	23.78
Germany	0.8038	84.00	61.23	130.02	33.70	40.66
Ghana	0.2444	17.11	1.12	100.99	0.25	33.92
Greece	0.6549	56.00	49.09	120.04	24.14	45.69
Grenada	0.4029	42.09	27.02	121.35	13.69	0.00
Guatemala	0.2713	16.00	11.56	137.82	1.80	4.50
Guinea	0.0504	1.49	0.16	41.75	0.01	0.00
Guinea-Bissau	0.0878	2.89	0.30	65.94	0.00	0.00
Guyana	0.2344	33.00	19.39	68.78	3.67	0.10
Haiti	0.0952	9.80	0.49	59.91	0.16**	0.16
Honduras	0.1951	18.12	7.69	92.87	0.77	4.76
Hungary	0.5654	72.00	29.68	116.07	22.87	24.14
Iceland	0.8591	96.21	58.00	106.18	34.71	72.24
India	0.1372	12.58	2.51	69.92	1.16	4.99

11. Telecommunication Infrastructure Index and its components (*continued*)

Country	*TII*	*Percentage of Individuals using the Internet*	*Fixed-telephone subscriptions per 100 inhabitants*	*Mobile-cellular telephone subscriptions per 100 inhabitants*	*Fixed (wired)-broadband subscriptions per 100 inhabitants*	*Wireless broadband subscriptions per 100 inhabitants*
Indonesia	0.3054	15.36	15.39	114.22	1.21	31.59
Iran (Islamic Republic of)	0.2940	26.00	37.63	76.10	4.03	1.34
Iraq	0.2173	7.10	5.71	81.63	0.00	37.14
Ireland	0.7039	79.00	43.88	107.21	22.72	65.87
Israel	0.7200	73.37	47.02	120.68	22.38	65.97
Italy	0.6747	58.00	35.57	159.69	22.15	52.15
Jamaica	0.2753	46.50	9.55	96.27	4.32	1.57
Japan	0.8553	79.05	50.51	108.73	27.74	112.40
Jordan	0.3104	41.00	6.20	128.17	2.76	10.86
Kazakhstan	0.5749	53.32	26.67	176.58	9.78	42.27
Kenya	0.1612	32.10	0.58	71.17	0.10	2.22
Kiribati	0.0665	10.75	8.93	15.88	0.99	0.00
Kuwait	0.5862	79.18	15.69	156.90	1.45	71.73
Kyrgyzstan	0.3801	21.72	8.93	124.18	2.61	59.63
Lao People's Democratic Republic	0.1618	10.75	1.69	97.69	1.40	0.74
Latvia	0.6237	74.00	24.32	112.11	23.35	58.24
Lebanon	0.4030	61.25	18.90	86.08	10.76	23.67
Lesotho	0.1179	4.59	2.10	63.94	0.14	10.45
Liberia	0.0763	3.79	0.00	57.12	0.00	0.03
Libya	0.3281	19.86	13.23	155.77	1.09	14.52
Liechtenstein	0.7468	89.41	50.39	97.35	32.95	48.40
Lithuania	0.5697	68.00	22.04	165.06	21.23	13.54
Luxembourg	0.8723	92.00	50.92	145.36	32.58	72.52
Madagascar	0.0488	2.05	0.64	38.41	0.04	0.06
Malawi	0.0484	4.35	1.43	27.78	0.01	3.46
Malaysia	0.4455	65.80	15.69	141.33	8.41	13.59
Maldives	0.3952	38.93	6.84	165.63	5.28	20.64
Mali	0.1350	2.17	0.75	98.38	0.01	0.73
Malta	0.7683	70.00	53.71	126.11	31.05	57.47
Marshall Islands	0.0448	10.00	10.60*****	1.27*****	0.00**	0.00
Mauritania	0.1626	5.37	1.71	106.00	0.17	3.64
Mauritius	0.4406	41.39	28.16	119.87	11.21	22.94
Mexico	0.3139	38.42	16.73	83.40	10.52	9.83
Micronesia	0.1099	25.97	8.12	26.69	0.90*	0.00
Monaco	1.0000	87.00	118.40	88.33	42.94	47.90
Mongolia	0.2714	16.40	6.32	120.69	3.75	18.37
Montenegro	0.5481	56.84	26.24	181.30	8.44	27.53
Morocco	0.3350	55.00	10.08	119.97	2.10	10.09
Mozambique	0.0545	4.85	0.35	36.24	0.08	1.78

11. Telecommunication Infrastructure Index and its components (*continued*)

Country	*TII*	*Percentage of Individuals using the Internet*	*Fixed-telephone subscriptions per 100 inhabitants*	*Mobile-cellular telephone subscriptions per 100 inhabitants*	*Fixed (wired)-broadband subscriptions per 100 inhabitants*	*Wireless broadband subscriptions per 100 inhabitants*
Myanmar	0.0084	1.07	1.05	10.30	0.01	0.03
Namibia	0.2719	12.94	7.58	107.79	2.91	30.22
Nauru	0.2159	54.00	0.00	67.78	0.00	9.97
Nepal	0.1684	11.15	3.08	59.62	0.45	28.01
Netherlands	0.8175	93.00	42.40	117.52	39.44	60.98
New Zealand	0.7506	89.51	42.15	110.36	27.80	65.94
Nicaragua	0.1692	13.50	5.34	89.22	1.65	1.01
Niger	0.0385	1.41	0.59	31.45	0.02	0.57
Nigeria	0.1905	32.88	0.25	66.80	0.01	18.37
Norway	0.8133	95.00	29.35	114.78	36.64	84.85
Oman	0.4873	60.00	9.19	159.25	2.15	50.94
Pakistan	0.1174	9.96	3.24	67.06	0.52	0.66
Palau	0.3592	26.97*****	35.08	82.64	2.95	32.31
Panama	0.4571	45.20	16.83	178.03	7.83	14.31
Papua New Guinea	0.0530	2.30	1.94	37.80	0.13	0.00
Paraguay	0.2236	27.08	5.62	101.59	1.11	6.06
Peru	0.2718	38.20	11.42	98.00	4.74	2.86
Philippines	0.2451	36.24	4.07	106.51	2.22	3.83
Poland	0.5618	65.00	16.03	133.05	16.68	52.90
Portugal	0.6094	64.00	42.98	116.11	22.55	32.76
Qatar	0.5879	88.10	15.95	126.80	7.75	68.28
Republic of Korea	0.9350	84.10	61.42	109.43	37.25	105.14
Republic of Moldova	0.4236	43.37	34.31	116.10	11.87	5.08
Romania	0.4385	50.00	21.51	104.35	15.63	23.40
Russian Federation	0.6413	53.27	29.97	182.92	14.43	52.80
Rwanda	0.0828	8.02	0.39	49.67	0.03	3.22
Saint Kitts and Nevis	0.6321	79.35	37.32	156.76	27.25	0.00
Saint Lucia	0.4000	48.63	20.37	125.50	13.59	0.00
Saint Vincent and the Grenadines	0.3810	47.52	17.72	123.87	12.45	0.00
Samoa	0.2672	12.92	10.82***	91.43***	0.11*	40.39
San Marino	0.6358	50.88	59.85	115.21	31.69	11.20
Sao Tomé & Principe	0.1398	21.57	4.25	64.86	0.48	0.00
Saudi Arabia	0.5523	54.00	16.97	187.40	6.95	45.38
Senegal	0.1644	19.20	2.46	83.57	0.70	3.58
Serbia	0.4681	48.10	31.16	95.66	10.49	42.05
Seychelles	0.4721	47.08	31.26	149.74	11.06	8.59
Sierra Leone	0.0821	1.30	0.30	36.96	0.00***	17.51
Singapore	0.8793	74.18	37.51	152.04	25.85	123.76
Slovakia	0.5296	80.00	17.90	111.91	14.66	39.71

11. Telecommunication Infrastructure Index and its components (*continued*)

Country	*TII*	*Percentage of Individuals using the Internet*	*Fixed-telephone subscriptions per 100 inhabitants*	*Mobile-cellular telephone subscriptions per 100 inhabitants*	*Fixed (wired)-broadband subscriptions per 100 inhabitants*	*Wireless broadband subscriptions per 100 inhabitants*
Slovenia	0.6193	70.00	39.89	108.61	24.29	36.95
Solomon Islands	0.1008	7.00	1.47	54.98	0.39	6.54
Somalia	0.0259	1.38	0.98	22.56	0.00**	0.00
South Africa	0.3466	41.00	7.69	130.56	2.11	25.20
South Sudan	0.0141	0.00	0.00	18.45	0.00	0.00
Spain	0.6629	72.00	41.11	108.36	24.26	53.42
Sri Lanka	0.2341	18.29	16.35	96.33	2.01	4.47
Sudan	0.1847	21.00	1.14	74.36	0.07	20.52
Suriname	0.3968	34.68	15.53	182.77	5.74	0.37
Swaziland	0.1629	20.78	3.95	65.39	0.27	11.90
Sweden	0.8866	94.00	45.43	122.41	32.13	101.10
Switzerland	0.8199	85.20	54.79	130.79	40.48	40.06
Syrian Arab Republic	0.1992	24.30	20.21	59.06	1.73	1.78
Tajikistan	0.2306	14.51	4.91	81.51	0.07	37.41
Thailand	0.2843	26.50	9.57	125.89	6.52	0.15
The Former Yugoslav Republic of Macedonia	0.4521	63.15	19.37	106.17	14.36	22.27
Timor-Leste	0.0704	0.91	0.27	55.74	0.05	0.40
Togo	0.0836	4.00	3.39	52.96	0.08	0.65
Tonga	0.2348	34.86	28.59	53.36	1.43	0.10
Trinidad & Tobago	0.4543	59.52	21.43	140.84	13.75	2.79
Tunisia	0.3074	41.44	10.17	118.08	4.71	5.13
Turkey	0.3605	45.13	18.73	91.46	10.62	16.45
Turkmenistan	0.2189	7.20	11.12	76.42	0.03	33.05
Tuvalu	0.1761	35.00	14.71	28.40	5.58	0.00
Uganda	0.1011	14.69	0.87	45.00	0.11	7.41
Ukraine	0.3802	33.70	26.76	130.34	8.00	5.43
United Arab Emirates	0.5932	85.00	21.37	149.64	10.34	44.85
United Kingdom of Great Britain and Northern Island	0.8534	87.02	52.58	130.78	34.04	72.06
United Republic of Tanzania	0.0808	3.95	0.37	56.96	0.01	1.49
United States of America	0.7406	81.03	43.78	97.64	27.88	74.90
Uruguay	0.5607	55.11	29.78	147.13	16.59	32.46
Uzbekistan	0.2333	36.52	6.88	71.03	0.71	20.36
Vanuatu	0.1188	10.60	2.35	55.41	1.05	8.25
Venezuela (Bolivarian Republic of)	0.3495	44.05	25.53	101.88	6.72	4.83
Viet Nam	0.3792	39.49	11.22	147.66	4.90	18.77
Yemen	0.1249	17.45	4.63	58.28	0.70	0.20
Zambia	0.1247	13.47	0.59	74.78	0.11	0.65
Zimbabwe	0.2238	17.09	2.20	91.91	0.52	28.14

ANNEX

Regional and Economic Grouping

Country	TII	Percentage of Individuals using the Internet	Fixed-telephone subscriptions per 100 inhabitants	Mobile-cellular telephone subscriptions per 100 inhabitants	Fixed (wired)-broadband subscriptions per 100 inhabitants	Wireless broadband subscriptions per 100 inhabitants
Africa	0.1478	13.41	3.77	71.41	1.00	6.70
Americas	0.3805	45.08	20.31	112.81	9.37	13.14
Asia	0.3584	37.63	15.25	103.75	6.66	29.44
Europe	0.6678	71.76	39.17	123.37	24.83	47.78
Oceania	0.2564	31.46	16.57	61.42	6.07	20.64
World	0.3650	39.40	18.40	98.02	9.74	23.57

	TII	Percentage of Individuals using the Internet	Fixed-telephone subscriptions per 100 inhabitants	Mobile-cellular telephone subscriptions per 100 inhabitants	Fixed (wired)-broadband subscriptions per 100 inhabitants	Wireless broadband subscriptions per 100 inhabitants
Small Island Developing States	0.3033	36.20	16.47	90.64	6.09	13.18
Land Locked Developing Countries	0.2025	18.49	6.53	78.84	2.34	14.83
Least Developed Countries	0.0929	7.89	1.81	52.32	0.37	3.38

	TII	Percentage of Individuals using the Internet	Fixed-telephone subscriptions per 100 inhabitants	Mobile-cellular telephone subscriptions per 100 inhabitants	Fixed (wired)-broadband subscriptions per 100 inhabitants	Wireless broadband subscriptions per 100 inhabitants
High Income	0.6845	75.21	38.41	124.91	23.71	54.97
Upper Middle Income	0.3522	39.99	17.36	111.12	7.47	16.26
Lower Middle Income	0.2307	24.17	9.56	89.58	2.61	11.75
Low Income	0.0876	5.72	1.24	51.50	0.08	5.00

Sources: International Telecommunications Union (ITU).
International Telecommunications Union (ITU) Country profiles indicated in yellow.
Year: 2012 or most recent data available.
* 2010
** 2008
*** 2007
**** 2005
***** 2004

12. Human Capital Index and its components

		Adult literacy (%)			Gross enrolment ratio (%)			Expected years of schooling			Mean years of schooling		
Country	*HCI*	*Index value*	*Year*	*Source*	*Index Value*	*Year*	*Source*	*Index value*	*Year*	*Source*	*Index Value*	*Year*	*Source*
Afghanistan	0.2418	28.00	2005	UNESCO	54.18	2009	UNESCO	8.15	2009	UNESCO	3.10	2010	UNESCO
Albania	0.7100	96.85	2011	UNESCO	67.69	2003	UNESCO	11.34	2003	UNESCO	10.40	2010	UNESCO
Algeria	0.6543	72.65	2006	UNESCO	80.82	2011	UNESCO	14.06	2011	UNESCO	7.60	2010	UNESCO
Andorra	0.7277	99.00	2005	UNESCO	69.00	2008	UNESCO	11.70	2008	UNESCO	10.40	2010	UNESCO
Angola	0.4941	70.36	2011	UNESCO	65.40	2010	UNESCO	10.24	2010	UNESCO	4.70	2010	UNESCO
Antigua and Barbuda	0.7669	98.95	2011	UNESCO	80.60	2011	UNESCO	13.58	2011	UNESCO	8.90	2010	UNESCO
Argentina	0.8571	97.86	2011	UNESCO	95.43	2010	UNESCO	16.43	2010	UNESCO	9.30	2010	UNESCO
Armenia	0.7660	99.57	2011	UNESCO	76.79	2010	UNESCO	12.16	2010	UNESCO	10.80	2010	UNESCO
Australia	0.9978	99.00	2005	UNESCO	110.21	2010	UNESCO	19.62	2010	UNESCO	12.00	2010	UNESCO
Austria	0.8660	99.00	2005	UNESCO	93.30	2011	UNESCO	15.59	2011	UNESCO	10.80	2010	UNESCO
Azerbaijan	0.7480	99.76	2009	UNESCO	70.27	2011	UNESCO	11.76	2011	UNESCO	11.20	2010	UNESCO
Bahamas	0.7138	95.80	2005	UNESCO	74.00	2007	UNESCO	12.60	2007	UNESCO	8.50	2010	UNESCO
Bahrain	0.7840	94.56	2010	UNESCO	85.30	2006	UNESCO	14.36	2006	UNESCO	9.40	2010	UNESCO
Bangladesh	0.3866	57.73	2011	UNESCO	56.00	2005	UNESCO	8.10	2006	UNESCO	4.80	2010	UNESCO
Barbados	0.8865	99.70	2005	UNESCO	102.21	2011	UNESCO	16.60	2011	UNESCO	9.30	2010	UNESCO
Belarus	0.8861	99.62	2009	UNESCO	97.20	2011	UNESCO	15.29	2011	UNESCO	11.50	2010	UNESCO
Belgium	0.8932	99.00	2005	UNESCO	97.28	2010	UNESCO	16.48	2010	UNESCO	10.90	2010	UNESCO
Belize	0.6012	70.30	1991	UNESCO	74.12	2003	UNESCO	12.10	2003	UNESCO	8.00	2010	UNESCO
Benin	0.2756	28.70	2006	UNESCO	57.79	2005	UNESCO	9.36	2005	UNESCO	3.20	2010	UNESCO
Bhutan	0.4290	52.81	2005	UNESCO	67.60	2011	UNESCO	12.37	2011	UNESCO	2.30	2010	UNESCO
Bolivia (Plurinational State of)	0.7424	91.17	2009	UNESCO	81.25	2007	UNESCO	13.48	2007	UNESCO	9.20	2010	UNESCO
Bosnia and Herzegovina	0.7288	98.00	2011	UNESCO	72.04	2011	UNESCO	13.58	2011	UNESCO	8.30	2010	UNESCO
Botswana	0.6555	85.09	2011	UNESCO	69.84	2006	UNESCO	11.84	2006	UNESCO	8.90	2010	UNESCO
Brazil	0.7372	90.38	2010	UNESCO	87.47	2005	UNESCO	14.23	2005	UNESCO	7.20	2010	UNESCO
Brunei Darussalam	0.7815	95.45	2011	UNESCO	83.56	2011	UNESCO	15.11	2011	UNESCO	8.60	2010	UNESCO
Bulgaria	0.7960	98.35	2011	UNESCO	79.87	2010	UNESCO	13.98	2010	UNESCO	10.60	2010	UNESCO
Burkina Faso	0.1578	28.73	2007	UNESCO	41.09	2011	UNESCO	6.88	2011	UNESCO	1.30	2010	UNESCO
Burundi	0.5393	86.95	2008	UNESCO	64.31	2010	UNESCO	11.33	2010	UNESCO	2.70	2010	UNESCO

12. Human Capital Index and its components (*continued*)

		Adult literacy (%)			Gross enrolment ratio (%)			Expected years of schooling			Mean years of schooling		
Country	*HCI*	*Index value*	*Year*	*Source*	*Index Value*	*Year*	*Source*	*Index value*	*Year*	*Source*	*Index Value*	*Year*	*Source*
Cambodia	0.5189	73.90	2009	UNESCO	61.70	2008	UNESCO	10.53	2008	UNESCO	5.80	2010	UNESCO
Cameroon	0.5421	71.29	2010	UNESCO	67.26	2011	UNESCO	11.50	2011	UNESCO	5.90	2010	UNESCO
Canada	0.8952	99.00	2005	UNESCO	93.47	2000	UNESCO	15.89	2000	UNESCO	12.30	2010	UNESCO
Cape Verde	0.6032	84.94	2011	UNESCO	75.55	2011	UNESCO	12.99	2011	UNESCO	3.50	2010	WB-IIDD
Central African Republic	0.3099	56.61	2011	UNESCO	43.02	2011	UNESCO	7.21	2011	UNESCO	3.50	2010	UNESCO
Chad	0.2341	35.39	2011	UNESCO	50.66	2011	UNESCO	8.15	2011	UNESCO	1.50	2010	WB-IIDD
Chile	0.8236	98.55	2009	UNESCO	87.61	2011	UNESCO	15.17	2011	UNESCO	9.70	2010	UNESCO
China	0.6734	95.12	2010	UNESCO	70.39	2011	UNESCO	11.88	2011	UNESCO	7.50	2010	UNESCO
Colombia	0.7348	93.58	2011	UNESCO	85.11	2011	UNESCO	13.64	2011	UNESCO	7.30	2010	UNESCO
Comoros	0.4662	75.54	2011	UNESCO	59.66	2005	UNESCO	10.21	2005	UNESCO	2.80	2010	WB-IIDD
Congo	0.5233	84.70	2011	UNDP	54.44	2003	UNESCO	9.43	2003	UNESCO	5.90	2010	UNESCO
Costa Rica	0.7582	96.26	2011	UNESCO	84.23	2011	UNESCO	13.52	2011	UNESCO	8.40	2010	UNESCO
Côte d'Ivoire	0.2992	56.87	2011	UNESCO	39.08	1999	UNESCO	6.49	1999	UNESCO	4.20	2010	UNESCO
Croatia	0.7928	98.88	2011	UNESCO	81.80	2010	UNESCO	14.11	2010	UNESCO	9.80	2010	UNESCO
Cuba	0.8497	99.83	2011	UNESCO	90.71	2011	UNESCO	15.44	2011	UNESCO	10.20	2010	UNESCO
Cyprus	0.7828	98.68	2011	UNESCO	79.20	2010	UNESCO	14.00	2010	UNESCO	9.80	2010	UNESCO
Czech Republic	0.8755	99.00	2005	UNESCO	86.03	2011	UNESCO	16.00	2011	UNESCO	12.30	2010	UNESCO
Democratic People's Republic of Korea	0.8007	100.00	2008	UNESCO	100.00	2012	UNESCO	10.00	2011	UNESCO	10.80		Average MYS cluster*
Democratic Republic of the Congo	0.3845	61.21	2007	UNESCO	55.63	2011	UNESCO	8.52	2011	UNESCO	3.50	2010	UNESCO
Denmark	0.9132	99.00	2005	UNESCO	99.24	2011	UNESCO	16.88	2010	UNESCO	11.40	2010	UNESCO
Djibouti	0.3182	70.30	2005	UNESCO	34.26	2011	UNESCO	5.75	2011	UNESCO	3.80	2010	UNESCO
Dominica	0.6701	88.00	2005	UNESCO	73.00	2008	UNESCO	12.70	2008	UNESCO	7.70	2010	UNESCO
Dominican Republic	0.6639	90.11	2011	UNESCO	73.20	2004	UNESCO	12.28	2004	UNESCO	7.20	2010	UNESCO
Ecuador	0.7037	91.59	2011	UNESCO	75.00	2005	UNESCO	13.70	2008	UNESCO	7.60	2010	UNESCO
Egypt	0.5912	73.87	2012	UNESCO	73.10	2010	UNESCO	12.41	2010	UNESCO	6.40	2010	UNESCO
El Salvador	0.6414	84.49	2010	UNESCO	71.40	2011	UNESCO	12.22	2011	UNESCO	7.50	2010	UNESCO
Equatorial Guinea	0.5288	94.23	2011	UNESCO	55.06	2002	UNESCO	7.89	2002	UNESCO	5.40	2010	UNESCO

Eritrea	0.2723	68.94	2011	UNESCO	28.47	2010	UNESCO	4.64	2010	UNESCO	3.40	2010	UNESCO
Estonia	0.8889	99.80	2011	UNESCO	91.22	2010	UNESCO	16.01	2010	UNESCO	12.00	2010	UNESCO
Ethiopia	0.2934	39.00	2005	UNESCO	57.43	2011	UNESCO	9.08	2011	UNESCO	2.20	2010	WB-IIDD
Fiji	0.8322	94.40	2005	UNESCO	87.50	2011	UNESCO	15.72	2011	UNESCO	10.70	2010	UNESCO
Finland	0.9037	99.00	2005	UNESCO	101.18	2011	UNESCO	17.04	2011	UNESCO	10.30	2010	UNESCO
France	0.8812	99.00	2005	UNESCO	95.73	2011	UNESCO	16.31	2011	UNESCO	10.60	2010	UNESCO
Gabon	0.6677	88.99	2011	UNESCO	75.37	1999	UNESCO	12.08	1999	UNESCO	7.50	2010	UNESCO
Gambia	0.3326	51.11	2011	UNESCO	54.13	2008	UNESCO	8.65	2008	UNESCO	2.80	2010	UNESCO
Georgia	0.7895	99.73	2011	UNESCO	71.89	2009	UNESCO	13.18	2009	UNESCO	12.10	2010	UNESCO
Germany	0.8862	99.00	2005	UNESCO	88.10	2011	UNESCO	16.40	2009	UNESCO	12.20	2010	UNESCO
Ghana	0.5613	71.50	2010	UNESCO	66.87	2012	UNESCO	11.62	2012	UNESCO	7.00	2010	UNESCO
Greece	0.8741	97.30	2011	UNESCO	98.60	2007	UNESCO	16.25	2007	UNESCO	10.10	2010	UNESCO
Grenada	0.8166	96.00	2005	UNESCO	91.11	2009	UNESCO	15.81	2009	UNESCO	8.60	2010	UNESCO
Guatemala	0.5272	75.86	2011	UNESCO	70.65	2007	UNESCO	10.66	2007	UNESCO	4.10	2010	UNESCO
Guinea	0.2359	25.31	2010	UNESCO	56.74	2011	UNESCO	9.47	2011	UNESCO	1.60	2010	UNESCO
Guinea-Bissau	0.3869	55.28	2011	UNESCO	65.40	2006	UNESCO	9.52	2006	UNESCO	2.30	2010	UNESCO
Guyana	0.6301	84.99	2009	UNESCO	70.44	2011	UNESCO	10.56	2011	UNESCO	8.50	2010	UNESCO
Haiti	0.3372	48.69	2006	UNESCO	53.00	2005	UNESCO	7.60	2009	UNESCO	4.90	2010	UNESCO
Honduras	0.6281	85.12	2011	UNESCO	74.54	2010	UNESCO	11.67	2010	UNESCO	6.50	2010	UNESCO
Hungary	0.8668	99.05	2011	UNESCO	89.80	2011	UNESCO	15.36	2011	UNESCO	11.70	2010	UNESCO
Iceland	0.9178	99.00	2005	UNESCO	97.25	2010	UNESCO	18.54	2010	UNESCO	10.40	2010	UNESCO
India	0.4698	62.75	2006	UNESCO	65.07	2010	UNESCO	10.90	2010	UNESCO	4.40	2010	UNESCO
Indonesia	0.6786	92.81	2011	UNESCO	77.61	2011	UNESCO	13.16	2011	UNESCO	5.80	2010	UNESCO
Iran (Islamic Republic of)	0.6882	85.02	2008	UNESCO	76.71	2011	UNESCO	13.78	2011	UNESCO	7.80	2010	UNESCO
Iraq	0.5283	78.48	2011	UNESCO	62.68	2004	UNESCO	10.04	2004	UNESCO	5.60	2010	UNESCO
Ireland	0.9619	99.00	2005	UNESCO	105.32	2011	UNESCO	18.65	2011	UNESCO	11.60	2010	UNESCO
Israel	0.8545	91.75	1983	UNESCO	92.15	2009	UNESCO	15.70	2009	UNESCO	11.90	2010	UNESCO
Italy	0.8552	98.98	2011	UNESCO	90.41	2010	UNESCO	16.15	2010	UNESCO	10.10	2010	UNESCO
Jamaica	0.7262	87.04	2011	UNESCO	81.84	2010	UNESCO	12.94	2010	UNESCO	9.60	2010	UNESCO
Japan	0.8621	99.00	2005	UNESCO	89.16	2010	UNESCO	15.30	2010	UNESCO	11.60	2010	UNESCO
Jordan	0.7202	95.90	2011	UNESCO	75.21	2010	UNESCO	12.65	2010	UNESCO	8.60	2010	UNESCO
Kazakhstan	0.8619	99.73	2009	UNESCO	93.95	2012	UNESCO	15.44	2012	UNESCO	10.40	2010	UNESCO
Kenya	0.5552	72.16	2007	UNESCO	67.03	2009	UNESCO	11.05	2009	UNESCO	7.00	2010	UNESCO
Kiribati	0.6812	93.00	2012	UN E-Gov Survey	73.34	2008	UNESCO	12.04	2008	UNESCO	7.80	2010	UNESCO

12. Human Capital Index and its components (*continued*)

		Adult literacy (%)			Gross enrolment ratio (%)			Expected years of schooling			Mean years of schooling		
Country	*HCI*	*Index value*	*Year*	*Source*	*Index Value*	*Year*	*Source*	*Index value*	*Year*	*Source*	*Index Value*	*Year*	*Source*
Kuwait	0.7194	93.91	2008	UNESCO	83.09	2004	UNESCO	14.17	2004	UNESCO	6.10	2010	UNESCO
Kyrgyzstan	0.7413	99.24	2009	UNESCO	75.04	2011	UNESCO	12.51	2011	UNESCO	9.30	2010	UNESCO
Lao People's Democratic Republic	0.4941	72.70	2005	UNESCO	61.48	2011	UNESCO	10.50	2011	UNESCO	4.60	2010	UNESCO
Latvia	0.8288	99.78	2011	UNESCO	81.32	2011	UNESCO	14.54	2011	UNESCO	11.50	2010	UNESCO
Lebanon	0.7374	89.61	2007	UNESCO	83.89	2011	UNESCO	14.37	2011	UNESCO	7.90	2010	UNESCO
Lesotho	0.5135	75.80	2009	UNESCO	59.73	2006	UNESCO	9.98	2006	UNESCO	5.90	2010	UNESCO
Liberia	0.3754	42.94	2007	UNESCO	63.19	2000	UNESCO	10.55	2000	UNESCO	3.90	2010	UNESCO
Libya	0.7821	89.54	2011	UNESCO	92.75	2003	UNESCO	16.20	2003	UNESCO	7.30	2010	UNESCO
Liechtenstein	0.8361	99.00	2012	UN E-Gov Survey	88.29	2011	UNESCO	15.12	2011	UNESCO	10.30	2010	UNESCO
Lithuania	0.8557	99.70	2011	UNESCO	88.95	2011	UNESCO	15.47	2011	UNESCO	10.90	2010	UNESCO
Luxembourg	0.7830	99.00	2005	UNESCO	77.87	2010	UNESCO	13.88	2010	UNESCO	10.10	2010	UNESCO
Madagascar	0.4889	64.48	2009	UNESCO	67.49	2009	UNESCO	10.44	2009	UNESCO	5.20	2010	WB-IIDD
Malawi	0.4746	61.31	2010	UNESCO	70.03	2011	UNESCO	10.85	2011	UNESCO	4.20	2010	UNESCO
Malaysia	0.7119	93.12	2010	UNESCO	71.33	2005	UNESCO	12.60	2005	UNESCO	9.50	2010	UNESCO
Maldives	0.6865	98.40	2006	UNESCO	76.11	2003	UNESCO	12.59	2003	UNESCO	5.80	2010	UNESCO
Mali	0.2212	33.44	2011	UNESCO	49.51	2011	UNESCO	7.51	2011	UNESCO	2.00	2010	UNESCO
Malta	0.7855	92.36	2005	UNESCO	81.89	2010	UNESCO	15.10	2010	UNESCO	9.90	2010	UNESCO
Marshall Islands	0.7002	94.00	2012	UN E-Gov Survey	69.16	2003	UNESCO	11.69	2003	UNESCO	9.85	2010	WB-IIDD
Mauritania	0.3581	58.61	2011	UNESCO	50.69	2011	UNESCO	8.17	2011	UNESCO	3.70	2010	UNESCO
Mauritius	0.6882	88.85	2011	UNESCO	76.00	2008	UNESCO	13.60	2008	UNESCO	7.20	2010	UNESCO
Mexico	0.7445	93.52	2011	UNESCO	81.24	2011	UNESCO	13.76	2011	UNESCO	8.50	2010	UNESCO
Micronesia (Federated States of)	0.7023	95.40	2010	UNESCO	75.45	2004	UNESCO	11.40	2009	UNESCO	8.80	2010	WB-IIDD
Monaco	0.7940	99.00	2012	UN E-Gov Survey	99.00	2012	UN E-Gov Survey	10.00		National Source	10.80		Average MYS cluster*
Mongolia	0.7887	97.36	2011	UNESCO	88.70	2011	UNESCO	14.47	2011	UNESCO	8.30	2010	UNESCO
Montenegro	0.8279	98.46	2011	UNESCO	85.81	2010	UNESCO	14.99	2010	UNESCO	10.50	2010	UNESCO

Morocco	0.4901	67.08	2011	UNESCO	64.90	2010	UNESCO	11.17	2010	UNESCO	4.40	2010	UNESCO
Mozambique	0.3457	50.58	2009	UNESCO	62.22	2011	UNESCO	9.74	2011	UNESCO	1.20	2010	UNESCO
Myanmar	0.5288	92.68	2011	UNESCO	57.36	2007	UNESCO	9.35	2007	UNESCO	3.90	2010	UNESCO
Namibia	0.5693	76.49	2007	UNESCO	69.42	2006	UNESCO	11.27	2006	UNESCO	6.20	2010	UNESCO
Nauru	0.5617	92.00	2012	UN E-Gov Survey	56.13	2008	UNESCO	9.35	2008	UNESCO	6.34		Average MYS cluster*
Nepal	0.3774	57.37	2011	UNESCO	57.63	2002	UNESCO	8.93	2002	UNESCO	3.20	2010	UNESCO
Netherlands	0.9224	99.00	2005	UNESCO	100.42	2010	UNESCO	17.04	2010	UNESCO	11.60	2010	UNESCO
New Zealand	1.0000	99.00	2005	UNESCO	107.91	2010	UNESCO	19.67	2010	UNESCO	12.50	2010	UNESCO
Nicaragua	0.5639	78.00	2005	UNESCO	70.15	2003	UNESCO	10.83	2003	UNESCO	5.80	2010	UNESCO
Niger	0.1192	28.67	2005	UNESCO	36.13	2011	UNESCO	5.26	2011	UNESCO	1.40	2010	UNESCO
Nigeria	0.3811	51.08	2008	UNESCO	55.85	2006	UNESCO	8.98	2005	UNESCO	5.20	2010	UNESCO
Norway	0.9380	99.00	2005	UNESCO	97.95	2010	UNESCO	17.47	2010	UNESCO	12.60	2010	UNESCO
Oman	0.6624	86.94	2010	UNESCO	77.93	2011	UNESCO	13.79	2011	UNESCO	5.50	2010	UNESCO
Pakistan	0.3337	54.89	2009	UNESCO	44.26	2011	UNESCO	7.49	2011	UNESCO	4.90	2010	UNESCO
Palau	0.7999	91.92	1980	UNESCO	82.37	2000	UNESCO	13.70	2000	UNESCO	12.20	2010	WB-IIDD
Panama	0.7455	94.09	2010	UNESCO	78.77	2010	UNESCO	13.23	2010	UNESCO	9.40	2010	UNESCO
Papua New Guinea	0.3000	62.42	2011	UNESCO	36.98	1998	UNESCO	5.89	1998	UNESCO	3.90	2010	UNESCO
Paraguay	0.6700	93.87	2010	UNESCO	69.51	2010	UNESCO	11.93	2010	UNESCO	7.70	2010	UNESCO
Peru	0.7289	89.59	2007	UNESCO	82.92	2010	UNESCO	13.21	2010	UNESCO	8.70	2010	UNESCO
Philippines	0.7051	95.42	2008	UNESCO	76.39	2009	UNESCO	11.30	2009	UNESCO	8.90	2010	UNESCO
Poland	0.8396	99.73	2011	UNESCO	88.89	2010	UNESCO	15.36	2010	UNESCO	10.00	2010	UNESCO
Portugal	0.8227	95.43	2011	UNESCO	96.93	2010	UNESCO	16.18	2010	UNESCO	7.70	2010	UNESCO
Qatar	0.6671	96.28	2010	UNESCO	62.14	2011	UNESCO	12.91	2011	UNESCO	7.30	2010	UNESCO
Republic of Korea	0.9273	99.00	2005	UNESCO	101.50	2010	UNESCO	17.16	2010	UNESCO	11.60	2010	UNESCO
Republic of Moldova	0.7201	98.97	2011	UNESCO	69.46	2011	UNESCO	11.85	2011	UNESCO	9.70	2010	UNESCO
Romania	0.8100	97.70	2011	UNESCO	83.69	2010	UNESCO	14.52	2010	UNESCO	10.40	2010	UNESCO
Russian Federation	0.8388	99.68	2010	UNESCO	85.34	2009	UNESCO	14.26	2009	UNESCO	11.70	2010	UNESCO
Rwanda	0.4820	65.85	2010	UNESCO	70.31	2011	UNESCO	11.08	2011	UNESCO	3.30	2010	UNESCO
Saint Kitts and Nevis	0.7279	97.80	2005	UNESCO	75.25	2008	UNESCO	12.88	2008	UNESCO	8.40	2010	UNESCO
Saint Lucia	0.7133	94.80	2005	UNESCO	74.56	2011	UNESCO	12.91	2011	UNESCO	8.30	2010	UNESCO
Saint Vincent and the Grenadines	0.7088	88.10	2005	UNESCO	78.26	2004	UNESCO	13.25	2004	UNESCO	8.60	2010	UNESCO

12. Human Capital Index and its components (*continued*)

		Adult literacy (%)			Gross enrolment ratio (%)			Expected years of schooling			Mean years of schooling		
Country	*HCI*	*Index value*	*Year*	*Source*	*Index Value*	*Year*	*Source*	*Index value*	*Year*	*Source*	*Index Value*	*Year*	*Source*
Samoa	0.7499	98.83	2011	UNESCO	73.83	2001	UNESCO	12.36	2001	UNESCO	10.30	2010	UNESCO
San Marino	0.8354	99.00	2012	UN E-Gov Survey	86.18	2011	UNESCO	15.43	2011	UNESCO	10.34		Average MYS cluster*
Sao Tome and Principe	0.5177	69.54	2008	UNESCO	71.37	2010	UNESCO	10.84	2010	UNESCO	4.70	2010	WB-IIDD
Saudi Arabia	0.7461	87.16	2011	UNESCO	87.70	2011	UNESCO	14.92	2011	UNESCO	7.80	2010	UNESCO
Senegal	0.3283	49.70	2009	UNESCO	49.72	2010	UNESCO	7.80	2008	UNESCO	4.50	2010	UNESCO
Serbia	0.7796	98.01	2011	UNESCO	78.87	2011	UNESCO	13.61	2011	UNESCO	10.20	2010	UNESCO
Seychelles	0.7310	91.84	2011	UNESCO	77.17	2011	UNESCO	13.15	2011	UNESCO	9.40	2010	UNESCO
Sierra Leone	0.2692	43.28	2011	UNESCO	46.74	2001	UNESCO	7.37	2001	UNESCO	3.30	2010	UNESCO
Singapore	0.8515	95.86	2010	UNESCO	102.80	2010	UNESCO	14.40	2009	UNESCO	10.10	2010	UNESCO
Slovakia	0.8265	99.00	2012	UNESCO	80.03	2011	UNESCO	14.72	2011	UNESCO	11.60	2010	UNESCO
Slovenia	0.9072	99.69	2011	UNESCO	94.56	2011	UNESCO	16.89	2011	UNESCO	11.70	2010	UNESCO
Solomon Islands	0.4702	76.60	1999	World Bank	55.20	2007	UNESCO	9.30	2007	UNESCO	4.50	2010	WB-IIDD
Somalia	0.0000	24.00	2012	UN E-Gov Survey	17.00	2011	UNDP	2.40	2000	UNESCO	1.35		Average MYS cluster*
South Africa	0.7282	92.98	2011	UNESCO	79.93	1999	UNESCO	13.10	2000	UNESCO	8.50	2010	UNESCO
South Sudan	0.4035	70.21	2012	UN E-Gov Survey	38.00	2012	UN E-Gov Survey	10.44	2011	UNESCO	3.83		Average MYS cluster*
Spain	0.9152	97.75	2010	UNESCO	105.65	2011	UNESCO	17.15	2011	UNESCO	10.40	2010	UNESCO
Sri Lanka	0.7376	91.18	2010	UNESCO	77.08	2011	UNESCO	13.84	2011	UNESCO	9.30	2010	UNESCO
Sudan	0.3059	71.94	2011	UNESCO	38.65	2007	UNESCO	4.48	2000	UNESCO	3.10	2010	UNESCO
Suriname	0.6749	94.68	2010	UNESCO	72.23	2002	UNESCO	12.05	2002	UNESCO	7.20	2010	UNESCO
Swaziland	0.6200	87.84	2011	UNESCO	66.71	2011	UNESCO	11.33	2011	UNESCO	7.10	2010	UNESCO
Sweden	0.8802	99.00	2005	UNESCO	91.77	2011	UNESCO	15.86	2011	UNESCO	11.70	2010	UNESCO
Switzerland	0.8562	99.00	2005	UNESCO	87.66	2011	UNESCO	15.80	2011	UNESCO	11.00	2010	UNESCO
Syrian Arab Republic	0.5835	84.06	2011	UNESCO	64.80	2005	UNESCO	11.70	2009	UNESCO	5.70	2010	UNESCO

Tajikistan	0.7249	99.71	2011	UNESCO	71.50	2011	UNESCO	11.51	2011	UNESCO	9.80	2010	UNESCO
Thailand	0.6640	93.51	2005	UNESCO	71.92	2009	UNESCO	12.30	2009	UNESCO	6.60	2010	UNESCO
The former Yugoslav Republic of Macedonia	0.7198	97.38	2011	UNESCO	71.29	2010	UNESCO	13.40	2010	UNESCO	8.20	2010	UNESCO
Timor-Leste	0.4831	58.31	2010	UNESCO	71.04	2009	UNESCO	11.72	2009	UNESCO	4.40	2010	WB-IIDD
Togo	0.5401	60.41	2011	UNESCO	76.27	2011	UNESCO	12.94	2011	UNESCO	5.30	2010	UNESCO
Tonga	0.8304	99.02	2006	UNESCO	88.53	2003	UNESCO	14.72	2003	UNESCO	10.30	2010	UNESCO
Trinidad and Tobago	0.6945	98.83	2011	UNESCO	64.10	2004	UNESCO	11.75	2004	UNESCO	9.20	2010	UNESCO
Tunisia	0.6717	79.13	2010	UNESCO	79.74	2011	UNESCO	14.91	2011	UNESCO	6.50	2010	UNESCO
Turkey	0.7133	94.11	2011	UNESCO	80.79	2010	UNESCO	13.75	2010	UNESCO	6.50	2010	UNESCO
Turkmenistan	0.7478	99.61	2011	UNESCO	73.00	2005	UNESCO	12.60	2009	UNESCO	9.90	2010	WB-IIDD
Tuvalu	0.7022	98.00	2012	UN E-Gov Survey	72.33	2001	UNESCO	10.80	2001	UNESCO	9.33		Average MYS cluster*
Uganda	0.5271	73.21	2010	UNESCO	68.54	2009	UNESCO	11.07	2009	UNESCO	4.70	2010	UNESCO
Ukraine	0.8616	99.72	2011	UNESCO	92.46	2011	UNESCO	14.79	2011	UNESCO	11.30	2010	UNESCO
United Arab Emirates	0.6657	90.03	2005	UNESCO	66.00	2000	UNESCO	12.00	2005	UNESCO	8.90	2010	UNESCO
United Kingdom of Great Britain and Northern Ireland	0.8574	99.00	2005	UNESCO	91.88	2010	UNESCO	16.72	2010	UNESCO	9.40	2010	UNESCO
United Republic of Tanzania	0.4492	67.80	2010	UNESCO	56.64	2012	UNESCO	9.22	2012	UNESCO	5.10	2010	UNESCO
United States of America	0.9390	99.00	2005	UNESCO	98.31	2010	UNESCO	16.76	2010	UNESCO	13.30	2010	UNESCO
Uruguay	0.8148	98.07	2010	UNESCO	89.95	2010	UNESCO	15.51	2010	UNESCO	8.50	2010	UNESCO
Uzbekistan	0.7264	99.43	2011	UNESCO	70.75	2011	UNESCO	11.60	2011	UNESCO	10.00	2010	UNESCO
Vanuatu	0.5736	83.22	2011	UNESCO	63.13	2004	UNESCO	10.57	2004	UNESCO	6.70	2010	UNESCO
Venezuela (Bolivarian Republic of)	0.7685	95.51	2005	UNESCO	89.18	2009	UNESCO	14.26	2009	UNESCO	7.60	2010	UNESCO
Viet Nam	0.6148	93.36	2011	UNESCO	63.40	1998	UNESCO	11.90	2010	UNESCO	5.50	2010	UNESCO
Yemen	0.3840	65.26	2011	UNESCO	54.67	2005	UNESCO	8.70	2005	UNESCO	2.50	2010	UNESCO
Zambia	0.4504	61.43	2007	UNESCO	60.50	2005	UNESCO	8.50	2009	UNESCO	6.70	2010	UNESCO
Zimbabwe	0.5445	83.58	2011	UNESCO	52.40	2005	UNESCO	10.1	1990	UNESCO	7.2	2010	UNESCO

* Refer to section A.3 Human Capital Index: Missing data for mean years of schooling.

ANNEX

Regional and economic groupings

	HCI	Adult literacy (%)	Gross enrolment ratio (%)	Expected years of schooling	Mean years of schooling
Africa	0.4492	64.65	59.74	9.87	4.65
Americas	0.7202	90.83	79.85	13.29	8.33
Asia	0.6615	86.79	74.08	12.38	7.58
Europe	0.8434	98.63	88.54	15.25	10.67
Oceania	0.7073	91.20	75.15	12.63	8.94
World	0.6566	84.29	74.41	12.50	7.68

	HCI	Adult literacy (%)	Gross enrolment ratio (%)	Expected years of schooling	Mean years of schooling
Small island developing States	0.6654	87.51	74.29	12.26	7.72
Land Locked Developing Countries	0.5368	73.86	64.92	10.74	6.14
Least Developed Countries	0.3960	59.98	56.26	9.04	3.87

	HCI	Adult literacy (%)	Gross enrolment ratio (%)	Expected years of schooling	Mean years of schooling
High Income	0.8343	97.58	88.87	15.30	10.25
Upper Middle Income	0.7253	92.17	78.54	13.29	8.58
Lower Middle Income	0.5787	80.19	66.84	11.08	6.56
Low Income	0.3884	57.28	56.69	9.06	3.95

13. E-Participation Index and its utilisation by stages

Rank 2014*	Country	EPI	Total (%)	Stage 1 (%)	Stage 2 (%)	Stage 3 (%)
152	Afghanistan	0.1373	13.79	22.22	9.09	0.00
59	Albania	0.5294	48.28	85.19	22.73	0.00
172	Algeria	0.0784	8.62	18.52	0.00	0.00
77	Andorra	0.4314	39.66	74.07	13.64	0.00
129	Angola	0.2353	22.41	40.74	9.09	0.00
63	Antigua and Barbuda	0.5098	46.55	66.67	36.36	11.11
54	Argentina	0.5490	50.00	85.19	27.27	0.00
59	Armenia	0.5294	48.28	85.19	22.73	0.00
7	Australia	0.9412	84.48	92.59	77.27	77.78
40	Austria	0.6275	56.90	96.30	31.82	0.00
77	Azerbaijan	0.4314	39.66	81.48	4.55	0.00
137	Bahamas	0.1961	18.97	33.33	9.09	0.00
14	Bahrain	0.8235	74.14	85.19	81.82	22.22
84	Bangladesh	0.3922	36.21	62.96	18.18	0.00
164	Barbados	0.0980	10.34	18.52	4.55	0.00
92	Belarus	0.3529	32.76	70.37	0.00	0.00
40	Belgium	0.6275	56.90	92.59	36.36	0.00
110	Belize	0.2941	27.59	51.85	9.09	0.00
143	Benin	0.1765	17.24	29.63	9.09	0.00
92	Bhutan	0.3529	32.76	62.96	9.09	0.00
81	Bolivia	0.4118	37.93	66.67	18.18	0.00
129	Bosnia and Herzegovina	0.2353	22.41	37.04	13.64	0.00
107	Botswana	0.3137	29.31	51.85	13.64	0.00
24	Brazil	0.7059	63.79	92.59	54.55	0.00
179	Brunei	0.0588	6.90	7.41	9.09	0.00
122	Bulgaria	0.2549	24.14	44.44	9.09	0.00
152	Burkina Faso	0.1373	13.79	18.52	13.64	0.00
179	Burundi	0.0588	6.90	14.81	0.00	0.00
137	Cambodia	0.1961	18.97	37.04	4.55	0.00
148	Cameroon	0.1569	15.52	33.33	0.00	0.00
14	Canada	0.8235	74.14	96.30	77.27	0.00
164	Cape Verde	0.0980	10.34	22.22	0.00	0.00
183	Central African Republic	0.0392	5.17	7.41	4.55	0.00
172	Chad	0.0784	8.62	14.81	4.55	0.00
7	Chile	0.9412	84.48	92.59	95.45	33.33
33	China	0.6471	58.62	85.19	50.00	0.00
11	Colombia	0.8824	79.31	74.07	81.82	88.89
183	Comoros	0.0392	5.17	11.11	0.00	0.00
164	Congo, Republic of	0.0980	10.34	14.81	9.09	0.00
14	Costa Rica	0.8235	74.14	92.59	77.27	11.11

13. E-Participation Index and its utilisation by stages (*continued*)

*Rank 2014**	*Country*	*EPI*	*Total (%)*	*Stage 1 (%)*	*Stage 2 (%)*	*Stage 3 (%)*
143	Cote d'Ivoire	0.1765	17.24	22.22	18.18	0.00
97	Croatia	0.3333	31.03	44.44	27.27	0.00
92	Cuba	0.3529	32.76	62.96	9.09	0.00
107	Cyprus	0.3137	29.31	40.74	22.73	11.11
122	Czech Republic	0.2549	24.14	40.74	13.64	0.00
186	Democratic People's Republic of Korea	0.0196	3.45	7.41	0.00	0.00
186	Democratic Republic of the Congo	0.0196	3.45	3.70	4.55	0.00
54	Denmark	0.5490	50.00	92.59	18.18	0.00
172	Djibouti	0.0784	8.62	18.52	0.00	0.00
158	Dominica	0.1176	12.07	25.93	0.00	0.00
97	Dominican Republic	0.3333	31.03	48.15	22.73	0.00
65	Ecuador	0.4902	44.83	77.78	22.73	0.00
54	Egypt	0.5490	50.00	70.37	40.91	11.11
45	El Salvador	0.6078	55.17	85.19	40.91	0.00
186	Equatorial Guinea	0.0196	3.45	7.41	0.00	0.00
192	Eritrea	0.0000	1.72	3.70	0.00	0.00
22	Estonia	0.7647	68.97	88.89	68.18	11.11
122	Ethiopia	0.2549	24.14	29.63	27.27	0.00
84	Fiji	0.3922	36.21	59.26	18.18	11.11
24	Finland	0.7059	63.79	92.59	45.45	22.22
4	France	0.9608	86.21	96.30	77.27	77.78
134	Gabon	0.2157	20.69	37.04	9.09	0.00
134	Gambia	0.2157	20.69	40.74	4.55	0.00
49	Georgia	0.5882	53.45	88.89	27.27	11.11
24	Germany	0.7059	63.79	96.30	45.45	11.11
84	Ghana	0.3922	36.21	66.67	13.64	0.00
17	Greece	0.8039	72.41	77.78	86.36	22.22
84	Grenada	0.3922	36.21	59.26	22.73	0.00
137	Guatemala	0.1961	18.97	22.22	22.73	0.00
186	Guinea	0.0196	3.45	7.41	0.00	0.00
186	Guinea-Bissau	0.0196	3.45	3.70	4.55	0.00
97	Guyana	0.3333	31.03	51.85	18.18	0.00
143	Haiti	0.1765	17.24	25.93	13.64	0.00
97	Honduras	0.3333	31.03	40.74	31.82	0.00
75	Hungary	0.4510	41.38	81.48	9.09	0.00
65	Iceland	0.4902	44.83	77.78	22.73	0.00
40	India	0.6275	56.90	92.59	36.36	0.00
110	Indonesia	0.2941	27.59	55.56	4.55	0.00
110	Iran (Islamic Republic of)	0.2941	27.59	55.56	4.55	0.00
152	Iraq	0.1373	13.79	22.22	9.09	0.00

13. E-Participation Index and its utilisation by stages (*continued*)

*Rank 2014**	*Country*	*EPI*	*Total (%)*	*Stage 1 (%)*	*Stage 2 (%)*	*Stage 3 (%)*
33	Ireland	0.6471	58.62	88.89	45.45	0.00
12	Israel	0.8627	77.59	96.30	86.36	0.00
19	Italy	0.7843	70.69	100.00	63.64	0.00
137	Jamaica	0.1961	18.97	29.63	13.64	0.00
4	Japan	0.9608	86.21	85.19	86.36	88.89
71	Jordan	0.4706	43.10	74.07	18.18	11.11
22	Kazakhstan	0.7647	68.97	88.89	68.18	11.11
33	Kenya	0.6471	58.62	92.59	40.91	0.00
110	Kiribati	0.2941	27.59	40.74	22.73	0.00
77	Kuwait	0.4314	39.66	70.37	18.18	0.00
81	Kyrgyzstan	0.4118	37.93	74.07	9.09	0.00
137	Lao	0.1961	18.97	40.74	0.00	0.00
24	Latvia	0.7059	63.79	81.48	59.09	22.22
110	Lebanon	0.2941	27.59	44.44	18.18	0.00
152	Lesotho	0.1373	13.79	25.93	4.55	0.00
158	Liberia	0.1176	12.07	14.81	13.64	0.00
179	Libya	0.0588	6.90	7.41	9.09	0.00
117	Liechtenstein	0.2745	25.86	40.74	18.18	0.00
33	Lithuania	0.6471	58.62	81.48	54.55	0.00
54	Luxembourg	0.5490	50.00	85.19	27.27	0.00
92	Madagascar	0.3529	32.76	62.96	9.09	0.00
129	Malawi	0.2353	22.41	44.44	4.55	0.00
59	Malaysia	0.5294	48.28	77.78	31.82	0.00
117	Maldives	0.2745	25.86	48.15	9.09	0.00
148	Mali	0.1569	15.52	33.33	0.00	0.00
71	Malta	0.4706	43.10	77.78	18.18	0.00
122	Marshall Islands	0.2549	24.14	51.85	0.00	0.00
172	Mauritania	0.0784	8.62	18.52	0.00	0.00
59	Mauritus	0.5294	48.28	81.48	27.27	0.00
45	Mexico	0.6078	55.17	100.00	22.73	0.00
122	Micronesia (Federated States of)	0.2549	24.14	51.85	0.00	0.00
164	Monaco	0.0980	10.34	14.81	9.09	0.00
30	Mongolia	0.6863	62.07	77.78	68.18	0.00
49	Montenegro	0.5882	53.45	74.07	40.91	22.22
17	Morocco	0.8039	72.41	85.19	72.73	33.33
97	Mozambique	0.3333	31.03	51.85	18.18	0.00
172	Myanmar (ex-Birma)	0.0784	8.62	14.81	4.55	0.00
97	Namibia	0.3333	31.03	55.56	9.09	11.11
172	Nauru	0.0784	8.62	14.81	4.55	0.00
110	Nepal	0.2941	27.59	48.15	13.64	0.00

13. E-Participation Index and its utilisation by stages (*continued*)

*Rank 2014**	*Country*	*EPI*	*Total (%)*	*Stage 1 (%)*	*Stage 2 (%)*	*Stage 3 (%)*
1	Netherlands	1.0000	89.66	96.30	86.36	77.78
19	New Zealand	0.7843	70.69	92.59	72.73	0.00
164	Nicaragua	0.0980	10.34	11.11	13.64	0.00
129	Niger	0.2353	22.41	48.15	0.00	0.00
97	Nigeria	0.3333	31.03	48.15	18.18	11.11
30	Norway	0.6863	62.07	92.59	45.45	11.11
24	Oman	0.7059	63.79	88.89	54.55	11.11
97	Pakistan	0.3333	31.03	62.96	4.55	0.00
129	Palau	0.2353	22.41	44.44	4.55	0.00
65	Panama	0.4902	44.83	81.48	18.18	0.00
192	Papau New Guinea	0.0000	1.72	3.70	0.00	0.00
122	Paraguay	0.2549	24.14	44.44	9.09	0.00
24	Peru	0.7059	63.79	85.19	45.45	44.44
51	Philippines	0.5686	51.72	81.48	36.36	0.00
65	Poland	0.4902	44.83	66.67	31.82	11.11
33	Portugal	0.6471	58.62	92.59	40.91	0.00
45	Qatar	0.6078	55.17	88.89	27.27	22.22
1	Republic of Korea	1.0000	89.66	96.30	81.82	88.89
40	Republic of Moldova	0.6275	56.90	81.48	36.36	33.33
71	Romania	0.4706	43.10	66.67	31.82	0.00
30	Russian Federation	0.6863	62.07	81.48	36.36	66.67
63	Rwanda	0.5098	46.55	77.78	27.27	0.00
158	Saint Kitts and Nevis	0.1176	12.07	22.22	4.55	0.00
117	Saint Lucia	0.2745	25.86	33.33	27.27	0.00
148	Saint Vincent and the Grenadines	0.1569	15.52	29.63	4.55	0.00
84	Samoa	0.3922	36.21	74.07	4.55	0.00
137	San Marino	0.1961	18.97	37.04	4.55	0.00
186	São Tomé and Príncipe	0.0196	3.45	7.41	0.00	0.00
51	Saudi Arabia	0.5686	51.72	85.19	27.27	11.11
92	Senegal	0.3529	32.76	70.37	0.00	0.00
81	Serbia	0.4118	37.93	62.96	22.73	0.00
122	Seychelles	0.2549	24.14	40.74	9.09	11.11
164	Sierra Leone	0.0980	10.34	11.11	13.64	0.00
10	Singapore	0.9020	81.03	96.30	90.91	11.11
40	Slovakia	0.6275	56.90	74.07	50.00	22.22
84	Slovenia	0.3922	36.21	48.15	31.82	11.11
172	Solomon Islands	0.0784	8.62	14.81	4.55	0.00
183	Somalia	0.0392	5.17	7.41	4.55	0.00
97	South Africa	0.3333	31.03	55.56	13.64	0.00

13. E-Participation Index and its utilisation by stages (*continued*)

*Rank 2014**	*Country*	*EPI*	*Total (%)*	*Stage 1 (%)*	*Stage 2 (%)*	*Stage 3 (%)*
179	South Sudan	0.0588	6.90	11.11	4.55	0.00
19	Spain	0.7843	70.69	100.00	63.64	0.00
33	Sri Lanka	0.6471	58.62	85.19	50.00	0.00
117	Sudan	0.2745	25.86	51.85	4.55	0.00
152	Suriname	0.1373	13.79	29.63	0.00	0.00
148	Swaziland	0.1569	15.52	29.63	0.00	11.11
45	Sweden	0.6078	55.17	85.19	40.91	0.00
91	Switzerland	0.3725	34.48	37.04	27.27	44.44
164	Syria	0.0980	10.34	14.81	9.09	0.00
158	Tajikistan	0.1176	12.07	22.22	4.55	0.00
54	Thailand	0.5490	50.00	85.19	27.27	0.00
134	The former Yugoslav Republic of Macedonia	0.2157	20.69	33.33	13.64	0.00
110	Timor-Leste	0.2941	27.59	48.15	13.64	0.00
164	Togo	0.0980	10.34	22.22	0.00	0.00
97	Tonga	0.3333	31.03	55.56	13.64	0.00
107	Trinidad and Tobago	0.3137	29.31	51.85	13.64	0.00
33	Tunisia	0.6471	58.62	81.48	54.55	0.00
65	Turkey	0.4902	44.83	70.37	27.27	11.11
158	Turkmenistan	0.1176	12.07	25.93	0.00	0.00
158	Tuvalu	0.1176	12.07	25.93	0.00	0.00
152	Uganda	0.1373	13.79	14.81	18.18	0.00
77	Ukraine	0.4314	39.66	62.96	27.27	0.00
13	United Arab Emirates	0.8431	75.86	92.59	72.73	33.33
4	United Kingdom	0.9608	86.21	96.30	77.27	77.78
84	United Republic of Tanzania	0.3922	36.21	74.07	4.55	0.00
9	United States	0.9216	82.76	96.30	63.64	88.89
3	Uruguay	0.9804	87.93	88.89	95.45	66.67
71	Uzbekistan	0.4706	43.10	77.78	18.18	0.00
143	Vanuatu	0.1765	17.24	33.33	4.55	0.00
51	Venezuela	0.5686	51.72	81.48	36.36	0.00
65	Vietnam	0.4902	44.83	70.37	31.82	0.00
117	Yemen	0.2745	25.86	51.85	4.55	0.00
143	Zambia	0.1765	17.24	33.33	4.55	0.00
75	Zimbabwe	0.4510	41.38	70.37	22.73	0.00

* In 2014, the E-Participation ranking used was the "Standard Competition Ranking" (1224), as opposed to the "Dense Ranking" (1223). Refer to section A.6 The e-Participation Index.

Regional and Economic Groupings

Country	*EPI*	*Total (%)*	*Stage 1 (%)*	*Stage 2 (%)*	*Stage 3 (%)*
Africa	0.2190	20.98	35.53	11.03	1.65
Americas	0.4398	40.39	58.73	30.39	9.84
Asia	0.4506	41.34	63.36	28.24	7.33
Europe	0.5454	49.68	73.21	35.94	12.66
Oceania	0.3095	28.94	46.83	16.23	6.35
World	0.3947	36.43	55.73	24.66	7.31

	EPI	*Total (%)*	*Stage 1 (%)*	*Stage 2 (%)*	*Stage 3 (%)*
Small Island Developing States	0.2595	24.55	40.94	13.76	1.75
Land Locked Developing Countries	0.2935	27.53	46.71	14.52	1.79
Least Developed Countries	0.1720	16.85	30.48	7.00	0.00

	EPI	*Total (%)*	*Stage 1 (%)*	*Stage 2 (%)*	*Stage 3 (%)*
High Income	0.6001	54.64	74.07	45.29	19.19
Upper Middle Income	0.3824	35.34	58.07	20.21	4.17
Lower Middle Income	0.3218	31.73	51.69	18.47	4.26
Low Income	0.1815	17.68	30.37	9.35	0.00

14. Regional and Economic Grouping

Country	*Region*	*Sub-Region*	*EGDI Level*	*Level of Income*	*GNI*
Afghanistan	Asia	Southern Asia	Low	Low	680
Albania	Europe	Southern Europe	High	Upper Middle	4030
Algeria	Africa	Northern Africa	Middle	Upper Middle	5020
Andorra	Europe	Southern Europe	Middle	High	41517*
Angola	Africa	Middle Africa	High	Upper Middle	4580
Antigua and Barbuda	Americas	Caribbean	Middle	High	12480
Argentina	Americas	South America	High	Upper Middle	10727*
Armenia	Asia	Western Asia	High	Lower Middle	3720
Austria	Europe	Western Europe	Very High	High	47660
Azerbaijan	Asia	Western Asia	Very High	Upper Middle	6220
Bahamas	Americas	Caribbean	High	High	20600
Bahrain	Asia	Western Asia	Middle	High	14820**
Bangladesh	Asia	Southern Asia	Very High	Low	840
Barbados	Americas	Caribbean	Middle	High	15080
Belarus	Europe	Eastern Europe	High	Upper Middle	6530
Belgium	Europe	Western Europe	High	High	44660
Belize	Americas	Central America	Very High	Upper Middle	4490*
Benin	Africa	West Africa	Middle	Low	750
Bhutan	Asia	Southern Asia	Low	Lower Middle	2420
Bolivia (Plurinational State of)	Americas	South America	Middle	Lower Middle	2220
Bosnia and Herzegovina	Europe	Southern Europe	Middle	Upper Middle	4750
Botswana	Africa	Southern Africa	Middle	Upper Middle	7650
Brazil	Americas	South America	Middle	Upper Middle	11630
Brunei Darussalam	Asia	South-Eastern Asia	High	High	31590***
Bulgaria	Europe	Eastern Europe	High	Upper Middle	6840
Burkina Faso	Africa	West Africa	High	Low	670
Burundi	Africa	Eastern Africa	Low	Low	240
Cambodia	Asia	South-Eastern Asia	Low	Low	880
Cameroon	Africa	Middle Africa	Middle	Lower Middle	1170
Canada	Americas	North America	Middle	High	50970
Cape Verde	Africa	West Africa	Very High	Lower Middle	3830
Central African Republic	Africa	Middle Africa	Middle	Low	510
Chad	Africa	Middle Africa	Low	Low	770
Chile	Americas	South America	Low	High	14310
China	Asia	Eastern Asia	High	Upper Middle	5720
Colombia	Americas	South America	High	Upper Middle	7020
Comoros	Africa	Eastern Africa	High	Low	840
Congo	Africa	Middle Africa	Low	Low	2550
Costa Rica	Americas	Central America	Middle	Upper Middle	8820
Côte d'Ivoire	Africa	West Africa	High	Lower Middle	1220
Croatia	Europe	Southern Europe	Low	High	13490

14. Regional and Economic Grouping (*continued*)

Country	*Region*	*Sub-Region*	*EGDI Level*	*Level of Income*	*GNI*
Cuba	Americas	Caribbean	High	Upper Middle	5890*
Cyprus	Asia	Western Asia	Middle	High	26110
Czech Republic	Europe	Eastern Europe	High	High	18120
Democratic People's Republic of Korea	Asia	Eastern Asia	High	Low	506*
Democratic Republic of the Congo	Africa	Middle Africa	Middle	Low	230
Denmark	Europe	Northern Europe	Low	High	59850
Djibouti	Africa	Eastern Africa	Very High	Lower Middle	1513*
Dominica	Americas	Caribbean	Low	Upper Middle	6440
Dominican Republic	Americas	Caribbean	Middle	Upper Middle	5470
Ecuador	Americas	South America	Middle	Upper Middle	5170
Egypt	Africa	Northern Africa	High	Lower Middle	2980
El Salvador	Americas	Central America	High	Lower Middle	3590
Equatorial Guinea	Africa	Middle Africa	Middle	High	13560
Eritrea	Africa	Eastern Africa	Low	Low	450
Estonia	Europe	Northern Europe	Low	High	16150
Ethiopia	Africa	Eastern Africa	Very High	Low	380
Australia	Oceania	Australia and New Zealand	Middle	High	59360
Finland	Europe	Northern Europe	High	High	46490
France	Europe	Western Europe	Very High	High	41750
Gabon	Africa	Middle Africa	Very High	Upper Middle	10040
Gambia	Africa	West Africa	Middle	Low	510
Georgia	Asia	Western Asia	Low	Lower Middle	3270
Germany	Europe	Western Europe	High	High	44260
Ghana	Africa	West Africa	Very High	Lower Middle	1550
Greece	Europe	Southern Europe	Middle	High	23260
Grenada	Americas	Caribbean	High	Upper Middle	7220
Guatemala	Americas	Central America	High	Lower Middle	3120
Guinea	Africa	West Africa	Middle	Low	440
Guinea-Bissau	Africa	West Africa	Low	Low	510
Guyana	Americas	South America	Low	Lower Middle	3410
Haiti	Americas	Caribbean	Middle	Low	760
Honduras	Americas	Central America	Low	Lower Middle	2120
Hungary	Europe	Eastern Europe	Middle	Upper Middle	12380
Iceland	Europe	Northern Europe	High	High	38330
India	Asia	Southern Asia	Very High	Lower Middle	1580
Indonesia	Asia	South-Eastern Asia	Middle	Lower Middle	3420
Iran (Islamic Republic of)	Asia	Southern Asia	Middle	Upper Middle	4290***
Iraq	Asia	Western Asia	Middle	Upper Middle	5870
Ireland	Europe	Northern Europe	Middle	High	39110
Israel	Asia	Western Asia	Very High	High	28380*
Italy	Europe	Southern Europe	Very High	High	33860

14. Regional and Economic Grouping (*continued*)

Country	*Region*	*Sub-Region*	*EGDI Level*	*Level of Income*	*GNI*
Jamaica	Americas	Caribbean	Very High	Upper Middle	5120
Japan	Asia	Eastern Asia	Middle	High	47880
Jordan	Asia	Western Asia	Very High	Upper Middle	4670
Kazakhstan	Asia	Central Asia	High	Upper Middle	9780
Kenya	Africa	Eastern Africa	High	Low	860
Fiji	Oceania	Melanesia	Middle	Upper Middle	4110
Kuwait	Asia	Western Asia	Middle	High	44100**
Kyrgyzstan	Asia	Central Asia	High	Upper Middle	990
Lao People's Democratic Republic	Asia	South-Eastern Asia	Middle	Lower Middle	1270
Latvia	Europe	Northern Europe	Middle	High	14120
Lebanon	Asia	Western Asia	High	Upper Middle	9190
Lesotho	Africa	Southern Africa	Middle	Lower Middle	1380
Liberia	Africa	West Africa	Middle	Low	370
Libya	Africa	Northern Africa	Low	Upper Middle	12930***
Liechtenstein	Europe	Western Europe	Middle	High	136770***
Lithuania	Europe	Northern Europe	High	High	13830
Luxembourg	Europe	Western Europe	High	High	71620
Madagascar	Africa	Eastern Africa	Very High	Low	430
Malawi	Africa	Eastern Africa	Middle	Low	320
Malaysia	Asia	South-Eastern Asia	Low	Upper Middle	9820
Maldives	Asia	Southern Asia	High	Upper Middle	5750
Mali	Africa	West Africa	Middle	Low	660
Malta	Europe	Southern Europe	Low	High	19760
Kiribati	Oceania	Micronesia	High	Lower Middle	2520
Mauritania	Africa	West Africa	Middle	Lower Middle	1110
Mauritius	Africa	Eastern Africa	Low	Upper Middle	8570
Mexico	Americas	Central America	High	Upper Middle	9640
Marshall Islands	Oceania	Micronesia	High	Upper Middle	4040
Monaco	Europe	Western Europe	Middle	High	167021*
Mongolia	Asia	Eastern Asia	High	Lower Middle	3160
Montenegro	Europe	Southern Europe	High	Upper Middle	7220
Morocco	Africa	Northern Africa	High	Lower Middle	2960
Mozambique	Africa	Eastern Africa	High	Low	510
Myanmar	Asia	South-Eastern Asia	Low	Lower Middle	1144*
Namibia	Africa	Southern Africa	Low	Upper Middle	5610
Micronesia (Federated States of)	Oceania	Micronesia	Middle	Lower Middle	3230
Nepal	Asia	Southern Asia	Middle	Low	700
Netherlands	Europe	Western Europe	Low	High	47970
Nauru	Oceania	Micronesia	Very High	Upper Middle	6746*
Nicaragua	Americas	Central America	Very High	Lower Middle	1650
Niger	Africa	West Africa	Middle	Low	390

14. Regional and Economic Grouping (*continued*)

Country	*Region*	*Sub-Region*	*EGDI Level*	*Level of Income*	*GNI*
Nigeria	Africa	West Africa	Low	Lower Middle	1440
Norway	Europe	Northern Europe	Middle	High	98860
Oman	Asia	Western Asia	Very High	High	19110**
Pakistan	Asia	Southern Asia	High	Lower Middle	1260
New Zealand	Oceania	Australia and New Zealand	Middle	High	30640*
Panama	Americas	Central America	Middle	Upper Middle	8510
Palau	Oceania	Micronesia	High	Upper Middle	9860
Papua New Guinea	Oceania	Melanesia	Middle	Lower Middle	1790
Paraguay	Americas	South America	Low	Lower Middle	3400
Peru	Americas	South America	Middle	Upper Middle	6060
Philippines	Asia	South-Eastern Asia	High	Lower Middle	2500
Poland	Europe	Eastern Europe	Middle	High	12660
Portugal	Europe	Southern Europe	High	High	20620
Qatar	Asia	Western Asia	High	High	76010*
Republic of Korea	Asia	Eastern Asia	High	High	22670
Republic of Moldova	Europe	Eastern Europe	Very High	Lower Middle	2070
Romania	Europe	Eastern Europe	High	Upper Middle	8820
Russian Federation	Europe	Eastern Europe	High	High	12700
Rwanda	Africa	Eastern Africa	High	Low	600
Saint Kitts and Nevis	Americas	Caribbean	Middle	High	13610
Saint Lucia	Americas	Caribbean	Middle	Upper Middle	6890
Saint Vincent and the Grenadines	Americas	Caribbean	Middle	Upper Middle	6400
Samoa	Oceania	Polynesia	High	Lower Middle	3260
San Marino	Europe	Southern Europe	High	High	56364*
Sao Tome and Principe	Africa	Middle Africa	Low	Lower Middle	1310
Saudi Arabia	Asia	Western Asia	High	High	21210*
Senegal	Africa	West Africa	Middle	Lower Middle	1030
Serbia	Europe	Southern Europe	High	Upper Middle	5280
Seychelles	Africa	Eastern Africa	High	Upper Middle	12260
Sierra Leone	Africa	West Africa	Low	Low	580
Singapore	Asia	South-Eastern Asia	Very High	High	47210
Slovakia	Europe	Eastern Europe	High	High	17180
Slovenia	Europe	Southern Europe	High	High	22800
Solomon Islands	Oceania	Melanesia	Low	Lower Middle	1130
Somalia	Africa	Eastern Africa	Low	Low	107*
South Africa	Africa	Southern Africa	Middle	Upper Middle	7610
South Sudan	Africa	Eastern Africa	Low	Low	790
Spain	Europe	Southern Europe	Very High	High	29620
Sri Lanka	Asia	Southern Asia	High	Lower Middle	2920
Sudan	Africa	Northern Africa	Middle	Lower Middle	1500

14. Regional and Economic Grouping (*continued*)

Country	*Region*	*Sub-Region*	*EGDI Level*	*Level of Income*	*GNI*
Suriname	Americas	South America	Middle	Upper Middle	8680
Swaziland	Africa	Southern Africa	Middle	Lower Middle	2860
Sweden	Europe	Northern Europe	Very High	High	55970
Switzerland	Europe	Western Europe	High	High	80970
Syrian Arab Republic	Asia	Western Asia	Middle	Lower Middle	2610**
Tajikistan	Asia	Central Asia	Middle	Low	860
Thailand	Asia	South-Eastern Asia	Middle	Upper Middle	5210
The former Yugoslav Republic of Macedonia	Europe	Southern Europe	Middle	Upper Middle	4620
Timor-Leste	Asia	South-Eastern Asia	Middle	Lower Middle	3620
Togo	Africa	West Africa	Low	Low	500
Tonga	Oceania	Polynesia	Middle	Upper Middle	4220
Trinidad and Tobago	Americas	Caribbean	Middle	High	14710
Tunisia	Africa	Northern Africa	High	Upper Middle	4150
Turkey	Asia	Western Asia	High	Upper Middle	10830
Turkmenistan	Asia	Central Asia	Middle	Upper Middle	5410
Tuvalu	Oceania	Polynesia	Middle	Upper Middle	5650
Uganda	Africa	Eastern Africa	Middle	Low	440
Ukraine	Europe	Eastern Europe	High	Lower Middle	3500
United Arab Emirates	Asia	Western Asia	High	High	35770*
United Kingdom of Great Britain and Northern Ireland	Europe	Northern Europe	Very High	High	38670
United Republic of Tanzania	Africa	Eastern Africa	Middle	Low	570
United States of America	Americas	North America	Very High	High	52340
Uruguay	Americas	South America	High	High	13580
Uzbekistan	Asia	Central Asia	Middle	Lower Middle	1720
Vanuatu	Oceania	Melanesia	Middle	Lower Middle	3000
Venezuela (Bolivarian Republic of)	Americas	South America	High	Upper Middle	12460
Viet Nam	Asia	South-Eastern Asia	Middle	Lower Middle	1550
Yemen	Asia	Western Asia	Middle	Lower Middle	1270
Zambia	Africa	Eastern Africa	Low	Lower Middle	1350
Zimbabwe	Africa	Eastern Africa	Middle	Low	650

Source: World Bank 2012 or most recent year available
Year: 2012 or Most recent data available in yellow.
* Most recent year available: 2011
** Most recent year available: 2010
*** Most recent year available: 2009

Notes

Chapter 1

1 A joint project of the United Nations Division for Public Economics and Public Administration (UNDPEPA) and the American Society for Public Administration (ASPA).

2 This was referred as e-government readiness index in past editions of the Survey (2003, 2004, 2005, 2008).

3 An important caveat about EGDI is that the absolute values of different years are not comparable given the methodology employed (see section on Survey Methodology). For instance, it is not statistically correct to compare the absolute values of EGDI 2014 and EGDI 2012 for any one region. However, the EGDI's rate of growth does present useful information.

4 Roelofsen, Occo and Sheng, Paul (2010).

5 Hosman, Laura and Elizabeth Fife (2012).

6 World Bank, African Development Bank and African Union, 2012.

7 Agency for the Development of Electronic Government and Information Society and Knowledge of Uruguay (AGESIC). Available from: (http://www.agesic.gub.uy/innovaportal/v/127/1/agesic/si_en_uruguay.html).

8 The productive structure refers to Latin America and the Caribbean economical idiosyncrasies such as the high transportation costs, the lower than average tax revenues, the excessive concentration of their exports based on its natural resources, the emergence of "middle class" and the substitution of local goods for imports. (OECD/ECLAC/Development Bank of Latin America (CAF) (2013), Latin American Economic Outlook 2014: Logistics and Competitiveness for Development, OECD Publishing. Available from: (http://dx.doi.org/10.1787/leo-2014-5-en).

9 United Nations Conference on Trade and Development, 2014.

10 TTBizLink platform. Available from: (https://www.ttbizlink.gov.tt/).

11 OECD, Newsroom article. Available from: (http://goo.gl/gheJ9j).

12 World Bank. World Development Indicators database, 2013.

13 Japan's e-Government Initiatives. Available from: (http://www.e-gov.go.jp/doc/e-government.html).

14 United Nations "Human Development Report", 2013.

15 GNI per capita, PPP (current international $), World Development Indicators database, World Bank.

16 E-government Strategy Baharain. Available from: (http://goo.gl/x6iF8c).

17 Bahrain International e-Government Forum 2013. Available from: (http://www.egovforum.bh/topics&agenda.php).

18 The Official Portal of the 3rd GCC. Available from: (www.gccegov.com).

19 Government of the United Kingdom, Cabinet Office, 2012, Government Digital Strategy. Available from: (http://www.publications.cabinetoffice.gov.uk/digital/strategy/).

20 Government of Spain, Ministry of Industry, Energy and Tourism, Avanza 2 Plan. Available from: (http://www.ontsi.red.es/ontsi/en/informacion-y-recursos/plan-avanza-2).

21 Government of Ireland, Department of Public Expenditure and Reform, Supporting Public Service Reform: eGovernment 2012-2015. Available from: (http://egovstrategy.gov.ie/).

22 The UN Member SIDS are: Antigua and Barbuda, Bahamas, Bahrain, Barbados, Belize, Cape Verde, Comoros, Cuba, Dominica, Dominican Republic, Fiji, Grenada, Guinea-Bissau, Guyana, Haiti, Jamaica, Kiribati, Maldives, Marshall Islands, Federal States of Micronesia, Mauritius, Nauru, Palau, Papua New Guinea, Samoa, São Tomé and Príncipe, Singapore, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Seychelles, Solomon Islands, Suriname, Timor-Leste, Tonga, Trinidad and Tobago, Tuvalu and Vanuatu. Source: UN office of High Representative for Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS). Available from: (http://www.unohrlls.org/en/sids/44/).

23 UN Conference on Small Island Developing States, Samoa 2014. Available from: (http://sids2014.org).

24 DRR consists of four phases—Mitigation, Preparedness, Response and Recovery.

25 Asian and Pacific Training Centre for Information and Communication Technology for Development (APCICT), 2010, ICT for Disaster Risk Reduction, ICTD Case Study 2. Available from: (http://www.preventionweb.net/files/14338_14338ICTDCaseStudy21.pdf).

26 Ibid.

27 Government of Trinidad and Tobago, Office of Disaster Preparedness and Management, Situation Report, 2010, Vol. 1, Issue 2. Available from: (http://www.odpm.gov.tt/pdf/SITuation%20REPort%20Vol%201%20Issue%202.pdf).

28 Prutsalis, Mark et al, (2010) / De Silva, Chamindra and Prustalis, Mark (2010).

29 United Nations Sustainable Development Platform, Small Island Developing States. Available from: (http://sustainabledevelopment.un.org/index.php?menu=203).

30 The LLDCs are: in Africa: Botswana, Burkina Faso, Burundi, Central African Republic, Chad, Ethiopia, Lesotho, Malawi, Mali, Niger, Rwanda, Swaziland, Uganda, Zambia, Zimbabwe; in Asia: Afghanistan, Bhutan, Kazakhstan, Kyrgystan, Lao People's Democratic Republic, Mongolia, Nepal, Tajikistan, Turkmenistan, Uzbekistan; in Europe: Armenia, Azerbaijan, Republic of Moldova, FYR Macedonia and in South America: Bolivia and Paraguay. Available from: (http://unctad.org/).

31 The LDCs are: in Africa: Angola, Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, South Sudan, Sudan, Togo, Uganda, Tanzania, Zambia; in Asia: Afghanistan, Bangladesh, Bhutan, Cambodia, Kiribati, Lao, Myanmar, Nepal, Samoa, Solomon Islands, Timor-Leste, Tuvalu, Vanuatu, Yemen; in South America and the Caribbean: Haiti. Source: UN Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UNOHRLLS). Available from: (http://www.unohrlls.org/en/ldc/25/).

32 United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS). Available from: (http://www.unohrlls.org/en/ldc/25/).

33 UN-OHRLLS, Factsheet, Least Developed Countries. Available from: (http://www.unohrlls.org/docs/ohrlls/ldcs/UN_LDC_Factsheet_130517.pdf).

34 The Committee for Development Policy, subsidiary body of the UN Economic and Social Council, uses the criteria of low national income, weak human assets (health, nutrition and education) and high economic vulnerability, for identifying LDCs. These factors combined lead to a lack of infrastructure and skills, such as ICT literacy and go a long way in explaining the challenges of the LDC's with regard to e-government.

35 Al-Wazir, Ali & Zheng, Zhao (2012) / Al-Hashmi, Asma & Suresha (2013).

Chapter 2

1 France. Secretariat général du gouvernement. Direction interministerielle des systèmes d'information et de communication. September 2012. Official circular entitled Usage du logiciel libre dans l'administration.

2 The connection with telecommunication infrastructure is drawn from a comparison of UN Survey data and the ICT development index.

3 Rwanda (2011). National ICT Policy and Action Plan III, 2011–2015.

4 PriceWaterhouseCoopers (2010). E-government strategy and implementation plan report: January 2011. Prepared for the Ministry of Communications and Information Technology of the Government of Ethiopia.

5 The online creativity component of WIPO's global innovation index includes number of generic and country code top-level domains, wikipedia monthly edits and video uploads on YouTube. WIPO (2013). Global Innovation Index: The Local Dynamics of Innovation. Available from: (http://www.wipo.int/export/sites/www/freepublications/en/economics/gii/gii_2013.pdf).

Chapter 3

1 The United Nations Public Administration Studies (UNPACS) is internal research undertaken by the United Nations Department of Economic and Social Affairs, Division for Public Administration and Development Management, forthcoming at: www.unpan.org/unpacs. The constitutions of United Nations Member States were reviewed for key words, serving as indicators of citizen engagement and freedom of information provisions.

2 See the UN's 3-level model of e-participation presented in this chapter and the 5-stage model of the International Association of Public Participation, cited in People Matter, Civic Engagement in Public Governance, World Public Sector Report 2008, United Nations. The latter defines participation into five categories of relationships: inform, consult, involve, collaborate and empower (see p.71). The effectiveness of each of these participation relationships hinges upon governance enablers (i.e. full political rights, civil liberties, freedom of expression etc.).

3 Most questions related to open government data also fall under e-information stage of e-participation. See related chapter for more detailed analysis on open government data and its role on e-participation.

4 These are Cuba, Madagascar, Malaysia, Mozambique and Zimbabwe.

5 The process of participatory budgeting initially started in Porte Alegre, Brazil in 1989. The practice consisted in series of neighbourhood, regional and citywide assemblies, where residents and elected budget delegates would identify spending priorities and vote on which priorities to implement. The form of participatory budgeting has changed over time and the practice is now spreading more online.

6 Thurlow, James (2012). "Climate Change and Development Policy". World Institute for Development Economics Research. Available from: (http://wider.unu.edu/publications/newsletter/articles-2012/en_GB/11-2012-JT/).

7 It is noteworthy that the rank order of sectors differs from the order for information provision, as shown in Figure.3.3.

8 Among these 20 countries, 6 are from the Americas, 5 from Europe, 5 from Asia, 3 from Africa and 1 from Oceania. From an income perspective, 11 are high income countries, 5 upper middle income countries, 3 lower middle income countries and 1 low income country.

9 Of the 10 countries committed to all five of the decision-making features of e-participation: three are from Europe, three from Asia, three from the Americas and one from Oceania. Seven are high income and three upper middle income countries.

10 United Nations (2013a).

Chapter 4

1 World Health Organization, Technical Brief, n.1, May 2008.

2 Australia Government Portal and United Kingdom Government portal respectively. Available from: (http://australia.gov.au/services/service-task/contact/contact-my-local-council) and (https://www.gov.uk/).

3 The Swedish Business Link. Available from: (http://www.verksamt.se/portal/en_GB/web/international/home).

4 Denmark citizen portal. Available from: (https://www.borger.dk).

5 Official site for the New Zealand Government ICT Functional Leader, the Government Chief Information Officer. Available from: (http://ict.govt.nz/).

6 Singapore Government Cloud (G-Cloud). Available from: (http://goo.gl/EqsVYo).

7 Pardo, Theresa A., Nam, Taewoo., & Burke, G Brian. (2012).

Chapter 5

1 Vulnerable groups include older persons, the illiterate, persons with disabilities, immigrants, people living in poverty, women and youth.

2 ITU Data, 2013.

3 Ibid.

4 Definition of smart phone: A cellular phone that is able to perform many of the functions of a computer, typically having a relatively large touchscreen and an operating system capable of running general-purpose computer applications.

5 Definition of feature phones: A cellular phone that contains a fixed set of functions beyond voice calling and text messaging, but is not as extensive as a smartphone.

6 Gartner (2013). Available from: (http://www.gartner.com/newsroom/id/2544115).

7 Ibid.

8 ITU Data, 2013.

9 United Nations Department of Economic and Social Affairs (UNDESA) (2012).

10 PricewaterhouseCoopers (PwC) (2009).

11 Government of Denmark, 2013. eGovernment strategy 2011–2015. Available from: (http://www.digst.dk/Servicemenu/English/Policy-and-Strategy/eGOV-strategy).

12 United Kingdom Cabinet Office, 2013. Available from: (http://publications.cabinetoffice.gov.uk/digital/).

13 Greater Amman Municipality, Jordan, 2013. Available from: (http://www.ammancity.gov.jo/en/gam/index.asp).

14 South Africa Government, 2013. Available from: (http://www.home-affairs.gov.za/index.php/identity-documents2).

15 Singapore Police Force, 2013. Available from: (http://www.spf.gov.sg/sms70999/).

16 Meeker, Mary., Wu, Liang (2013). "Internet Trends D11 Conference". Kleiner Perkins Caufield Byers (KPCB), p41 , (5/29/2013).

17 Communications Commission of Kenya (CCK), 2013.

18 Deloitte (2013).

19 IDA, Singapore, 2013. Available from: (http://www.egov.gov.sg/egov-programmes/programmes-by-citizens/citizen-connect).

20 World Bank (2009). Public-private partnerships in e-government: Knowledge map.

21 Philippines Government Portal. Available from: (http://ppp.gov.ph).

22 Tode, Chantal (2013). "Federal government boosts digital strategy with mobile apps, security programs" Mobile Marketer News, 2013. Available from: (http://www.mobilemarketer.com/cms/news/content/15449.html)

23 Fu, Yaqin and Ke Xiao, (2012).

24 Reddick, Christopher G. and Michael Turner (2012).

25 Information and Communication Technology Agency of Sri Lanka, 2013. Available from: (http://goo.gl/5p4Ln6)

26 United Nations Public Service Award, 2012.

27 European Union, 2013.

28 There were 5 stages in the first model (2003–2008) and it was changed to a 4-stage model starting from the 2010 Survey.

29 Channel optimization is assessed through the accumulated score of Survey questions with an influence of anyone channel (as stated in earlier section) in accordance with the 2014 Survey.

30 *United Nations E-Government Survey* 2012.

31 European Commission (2004).

32 Ibid.

33 Big data is a collection of data sets that is large and complex that it becomes difficult to process using normal database management tools or traditional data processing applications.

34 "Mohammed renames Dubai e-Government as m-Government". The Gulf Today June 21 2013. Available from: (http://www.gulftoday.ae/portal/c3950ab6-1201-44b5-a161-75d01130b376.aspx).

35 OECD/International Telecommunication Union (2011).

36 Figure for 2016 is estimated using the least square fitting methodology.

37 Kevin Werbach (2012), Wharton School of Business. Gamification is described as "the use of game elements and game design techniques in non-game contexts".

38 Opower website. Available from: (http://opower.com).

39 m.Paani initiative. Available from: (http://mpaani.com/).

40 IDA Singapore, 2013. Available from: (http://www.egov.gov.sg/egov-programmes/programmes-by-citizens/oneinbox).

41 Department of Human Services, Australia, 2013. Available from: (http://www.humanservices.gov.au/customer/services/centrelink/mobile-service-centres).

Chapter 6

1 United Nations (2013b).

2 Ibid.

3 G20 economies including the following 19 countries : Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, the Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom, the United States of America plus the European Union. Available from: (http://www.g20.org/docs/about/about_G20.html).

4 World Internet Project International report. 4th Edition. USC Annenberg School Center for the Digital Future. 2012. Available from: (http://www.worldinternetproject.net/_files/_Published/_oldis/770_2012wip_report4th_ed.pdf).

5 Digital Differences. Pew Internet & American Life Project, Pew research Center. 13 April 2012. Available from: (http://goo.gl/r2GeIQ.).

6 UN Convention on the Rights of Persons with Disabilities. Available from: (http://www.un.org/disabilities/convention/conventionfull.shtml).

7 A person is functionally literate who can engage in all those activities in which literacy is required for effective functioning of his group and community and also for enabling him to continue to use reading, writing and calculation for his own and the community's development.' (UNESCO, EFA Global Monitoring Report 2006) Available from: (http://goo.gl/1pvfTH).

8 Internet World Statistics. Available from: (http://www.internetworldstats.com/stats3.htm#asia).

9 Census of India. 2011. Available from: (http://www.censusindia.gov.in/2011-prov-results/indiaatglance.html).

Chapter 7

1 E-government uptake, defined as "the percentage of individuals (aged 16–74) who have used the Internet to interact with public authorities" (e.g. as per OECD's definition). It is important to note that the usage rate of countries in EU and beyond does not necessarily reflect the actual level of usage, as seen in the case of the UK, of which e-government uptake is lower than expected. This is due to availability of services such as citizen self-service in some countries like Belgium, Denmark and Ireland. Services like automatic payment of child allowance (triggered by birth registration or automatic start) and payment of pension (triggered by age, or many other cross-silo services) reduces frequency of citizens' interactions with public authorities both via offline and online. It thereby reduces citizens' (active) use of such public services, with countries showing lower usage rate than the actual rate of usage. At the most fundamental level sometimes, lack of and/or a reduction in "use" can result in increased benefits to the stakeholders, depending on the types of service, etc.

2 European Commission (2013).

3 European Commission/Capgemini Group (2013).

4 Statistics Norway CT (2013), Usage in households, 2013, 2nd quarter. Available from: (http://www.ssb.no/en/ikthus/).

5 OECD (2013a).

6 Turkish statistical institute (2013), News Release: ICT usage survey on households and individuals, 22 August 2013. Available from: (http://www.turkstat.gov.tr/PreHaberBultenleri.do?id=13569).

7 OECD (2013b).

8 Nasr, J. (2013), Implementing electronic tax filing and payments in Malaysia.

9 New York Times (2013), "Most of U.S. Is Wired, but Millions Aren't Plugged In", August 18, 2013.

10 Nielsen Norman-Group (2013), Seniors as web users. Available from: (http://www.nngroup.com/articles/usability-for-senior-citizens/).

11 United Kingdom Government Digital Services: Design Principles. Available from: (https://www.gov.uk/design-principles).

12 Copenhagen city: E-government change agent, in: Asia Pacific futuregov, 10 January 2013.

13 The subdivisions are based on one or more user characteristics. The segments are then "targeted" in the most suitable way over the most appropriate channels.

14 It is also important to know what types of devices are being used by their citizens, see: ITU and OECD (2011), M-government: Mobile technologies for responsive governments and connected societies.

15 United States General Services Administration (2013), Mobile ubiquity. Available from (http://www.gsa.gov/portal/content/289089).

16 Global marketing: Georgetown university (2011), Chilean Business + Social Media = An economic purpose.

17 Inter-American dialogue (2013), Can Technology Help Quell Citizens' Anger at Their Governments?

18 Digital Communities (2009), San Francisco Mayor Gavin Newsom Announces 311 Twitter Service, June 4, 2009.

19 Press release, May 28, 2013, The European Commission eGovernment Benchmark: Further Uptake Required To Meet Growing Citizens' Expectations For Public Services.

20 Broadband Commission working group on education (2013), Advancing the education for all agenda—A report by the Broadband Commission.

21 Pakistan gender news (2013), SMS-based literacy programme: Education may be just a text message away. Available from: (http://goo.gl/eq1P1t).

22 OECD (2012).

23 Federal communications commission (2010), Connecting America: the national broadband plan.

24 Sci, Dev (2012), "African e-health 'moving in direction", Net 02/12/11.

25 Ministry of Health, Uganda (2013), mTrac is Changing the Face of Health Operations in Uganda. Available from: (http://www.unicef.org/uganda/mTrac_article(1).pdf).

26 UNICEF (2012).

27 Hearing before the Subcommittee on oversight, investigation and management of the Committee on Homeland Security, House of Representatives (2012), "America is under cyber-attack: why urgent action is needed", One hundred twelfth congress second session, April 24, 2012. Available from: (http://www.gpo.gov/fdsys/pkg/CHRG-112hhrg77380/html/CHRG-112hhrg77380.htm).

28 R. Craig Lefebvre and Bornkessel, A.S. (2013).

29 Lauren Dawes, Revital Marom (2013).

30 GSMA (2012), Shaping the Future—Realizing the potential of informal learning through mobile, 2012.

31 Copenhagen city: E-government change agent, in: Future Gov (10 January, 2013).

32 European Digital Competitiveness Report 2010/secondary ref.

33 National Telecommunications and Information Administration and Economics and Statistics Administration in the Department of Commerce (2013), Exploring the digital nation—America's emerging online experience.

34 Ehrbeck, Tilman. Lochan. Rajiv. Sinha, Supriyo. Zainulbhai, Adil (2010).

35 Using Technology to Track How Citizens Experience Water Service Delivery in India. Available from: (http://goo.gl/3qP8jv).

36 Around the world, a number of countries provide online user feedback opportunities to enhance the governments' ability to receive and take on board feedback from citizens, so as to better tailor their services to meet the actual needs and priorities of users. For example, a few countries' national portals provide web statistics on citizen usage (in 47 countries), features on seeking comments from citizens to improve its online services (in 68 countries) and section for "hot topics" or mostly used features (in 80 countries) and a much smaller number of countries (20 countries) provide outcome on feedback received from citizens concerning the improvement of its online services.

37 O'Reilly (2009).

Chapter 8

1 Open Government Data Working Group, 8 Open Government Data Principles, 2008, Sebastopol, USA.

2 National statistics portals are not considered as dedicated data portals during the assessment. Instead, researchers checked the existence of a data catalogue, usually called open government data portal, such as data.gov or data.gov.uk.

3 Refer to OpenSpending.org.

4 International Budget Partnership (2012). Open Budget Survey 2012. Available from (http://internationalbudget.org/what-we-do/open-budget-Survey/).

5 United Nations Public Administration Country Studies (UNPACS) (2014). "Research and Analysis on Regulatory Frameworks", DPADM.

6 New Zealand (2011). "New Zealand Data and information Management Principles". Government ICT Strategy and Action Plan to 2017.

7 Tauberer, Joshua (2012).

8 Republic of Korea (2013). Act on Provision and Active Use of Public Data. Available from: (http://www.law.go.kr/lsEfInfoP.do?lsiSeq=142444#0000).

9 White House, the (2013). Executive Order—Making Open and Machines Readable the New Default for Government Information. Office of the Press Secretary (9 May 2013). Available from: (http://goo.gl/U7PxAb).

10 Open Data in Russia (2013). Implementing Russian Open Data Conception: Public and Local Government Bodies Progress Report 2013. Available from: (http://goo.gl/emIdeC).

11 Creative Commons Attribution 3.0 Unported (CC by 3.0). Available from: (http://creativecommons.org/licenses/by/3.0/).

12 Australia Official Data Portal.Available from: (http://data-au.govspace.gov.au/about).

13 Austria Open Data Portal. Available from: (http://data.gv.at/kontakt).

14 Isreal Government Portal. Available from: (http://www.gov.il/FirstGov/BottomNavEng/abouteng/about-goveng).

15 Colombia Data Portal. Available from: (http://datosabiertoscolombia.cloudapp.net/frm/Acerca/frmAcercaDe.aspx).

16 Ghana Open Data Initiative.Available from: (http://data.gov.gh/about-us).

17 Singapore Data Portal. Available from: (http://data.gov.sg).

18 Spain Open Data Portal. Available from: (http://datos.gob.es).

19 France Official Data Portal. Available from: (http://www.data.gouv.fr/A-propos).

20 Woodie, Alex (2013).

21 Chong, Rachelle (2013).

22 The Gazette of India (2012). New Delhi, India (17-23 March 2012). Available from: http://www.dst.gov.in/nsdi_gazette.pdf.

23 White House (2013). Memorandum for the Heads of Executive Department and Agencies: Open Data Policy—Managing Information as an Asset. Executive Office of the President, Office of Management and Budget (9 May 2013).

24 All Africa (2013). Liberia: Finance, UNDP Launch (27 September 2013). Available from: http://allafrica.com/stories/201309271088.html.

25 Cambodia Open Development. Available from: (http://www.opendevelopmentcambodia.net/).

26 Sarpam. Southern African Regional Programme on Access to Medicines and Diagnostics. Available from: (http://www.sarpam.net/).

27 Kenya Open Data Portal. Available from (http://opendata.go.ke).

28 Banisar, David (2011).

29 Internews in Kenya. Available from: (http://www.internewskenya.org/dataportal/content?page=about).

30 Kronrnburg, Tom (2011).

31 Jalote, Sumedha (2013).

32 Deloitte (2012).

33 Capgemini Consulting. The Open Data Economy: Unlocking Economic Value by Opening Government and Public Data. Available from: (http://www.capgemini-consulting.com/the-open-data-economy-0).

34 Koski, Heli (2011).

35 Howard, Alexander B. (2011).

Annex

1 ITU (2012b).

2 Ibid.

3 The International Telecommunication Union is the primary source of data for computation of TII.

4 United Nations (2013c).

5 Expected years of education is also known as "School life expectancy". Available from: (http://www.uis.unesco.org/Library/Documents/eiguide09-en.pdf).

6 Mean years of schooling (MYS) methodology. Available from: (http://www.uis.unesco.org/Education/Pages/mean-years-of-schooling.aspx).

7 Barro Lee methodology. Available from: (http://www.uis.unesco.org/Education/Pages/mean-years-of-schooling.aspx and http://www.barrolee.com/).

References

Adamson, Claire (2013). "Building lasting bridges: Good and bad eGovernment strategies in Africa." eLearning Africa News, April 12, 2013. Available from: (http://goo.gl/nESnT8).

Al-Hashmi, Asma & Suresha, (2013). "Evaluating the Awareness of EGovernment in the Republic of Yemen". International Journal of Computer Applications Vo. 67 No. 16, Available from: (http://research.ijcaonline.org/volume67/number16/pxc3887185.pdf).

Al-Wazir, Ali & Zheng, Zhao, (2012). "EGovernment Development in Yemen: Assessments and Solutions". Journal of Emerging Trends in Computing and Information Sciences Vol.3 No.4 Available from: (http://cisjournal.org/journalofcomputing/archive/vol3no4/vol3no4_7.pdf).

Banisar, David (2011). "The Right to Information and Privacy: Balancing Rights and Managing Conflicts". World Bank Institute Governance Working Paper (10 March, 2011).

Biztech Africa (2012) "Bandwidth a constraint to e-learning". BiztechAfrica—May 27, 2012. Available from: (http://goo.gl/gBlry3).

Bourgon, Jocelyne (2001). "Technology broadband and education: Advancing education for all agenda."A New Synthesis of Public Administration, Broadband Commission Working Group on Education (2013). Broadband Commission.

Capgemini (2013). "The European Commission eGovernment Benchmark: Further Uptake Required To Meet Growing Citizens" Expectations For Public Services," May 28, 2013, Press release.

Centro Latinoamericano y Caribeño de Demografía (CELADE) (2013). "DEPUALC: Distribución Espacial De La Población Y Urbanización En América Latina Y El Caribe." División de población CELADE de la Comisión Económica para América Latina y el Caribe. Available from: (http://www.eclac.cl/celade/depualc/).

CGAP and DFID (2009). "Banking the Poor via G2P Payments." Focus Note, December 2009.

Chong, Rachelle (2013). "SF Mayor Signs Landmark Open Data Policy and Procedures Legislation". Government Technology: Solution for State and Local Government (1 May 2013).

Comisión Económica para América Latina y el Caribe (CEPAL) (2013). "Estrategias de TLC ante el desafío del cambio estructural en América Latina y el Caribe." CEPAL—Colección Documentos de proyectos; Naciones Unidas; marzo 2013.

De Silva, Chamindra and Prustalis, Mark, The Sahana (2010). "Free and Open Source Disaster Management System in Haiti in Asian and Pacific Training".Centre for Information and Communication Technology for Development (APCICT), ICT for Disaster Risk Reduction, ICTD Case Study 2. Available from: (http://unapcict.org/ecohub/ict-for-disaster-riskreduction-1).

Deloitte (2012). "Open Data: Driving Grown, Ingenuity and Innovation". Deloitte Analytics (June 2012).

- (2013). "Enterprise Social Networks: Useful Tool, Not a Panacea". Deloitte Touche Tohmatsu Limited.

Dunta Times (2013), "Report says FATÍH Project effective, but content needs revision." Dunta Times Available from: (http://goo.gl/BX5rgy)

Ehrbeck, Tilman. Lochan. Rajiv. Sinha, Supriyo. Zainulbhai, Adil (2010). "Inclusive growth and financial security—the benefits of e-payments to Indian society". McKinsey & Company, Inc. October 2010.

eMarketer (2013). "Worldwide Social Network Users: 2013 Forecast and Comparative Estimates." News 2013.

Eszter Hargittai (2002). "Second-Level Digital Divide: Differences in People's Online Skills." First Monday 7, n. 4 (April 2002). Available from: (http://firstmonday.org/issues/issue7_4/hargittai/index.html).

European Commission (2004). "Multi-channel delivery of eGovernment services". European Commission and Interchange of Data between Administrations (IDA). Available from: (http://ec.europa.eu/idabc/servlets/Doc282e.pdf?id=16867).

- (2006). "Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: i2010 eGovernment Action Plan: Accelerating eGovernment in Europe for the Benefit of All".

- (2010). "Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: i2010 eGovernment Action Plan 2011–2015: Harnessing ICT to promote smart, sustainable & innovative Government." Available from: (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0743:FIN:EN:PDF).

- (2011). "Digital Agenda For Europe and European eGovernment Action Plan 2011–2014." Available from: (http://ec.europa.eu/digital-agenda/digital-agenda-europe).

- (2012a). "eHealth Action Plan 2012–2020: Frequently Asked Questions, European Commission—MEMO/12/959 07/12/2012".

- (2012b), Public Services Online. "'Digital by Default or by Detour?' Assessing User Centric eGovernment performance in Europe—eGovernment Benchmark 2012".

- (2013) "Digital Agenda Scoreboard 2013", Staff Working Document, Brussels.

European Commission/Capgemini Group (2013). "Public Services Online—'Digital by Default or by Detour?', Assessing User Centric eGovernment performance in Europe—eGovernment Benchmark 2012." Press Release Database, eGovernment improving but citizens ask for more, European Commission- IP/13/466 28/05/2013.

European Commission Directorate General (2013). "Communications Networks, Content and Technology (2013), Public services: eGovernment Action Plan." Available from: (http://ec.europa.eu/dgs/connect/en/content/public-services-egovernment-action-plan).

EUROSTAT (2013). "Individuals using Internet for interaction with public authorities Individuals using Internet for interaction with public authorities." Last update: 18-12-2013. Available from: (http://appsso.eurostat.ec.europa.eu/nui/show.do?wai=true&dataset=isoc_pibi_igov).

Fox, S. and Duggan, M. (2012). "Mobile Health 2012, Half of smartphone owners use their devices to get health information." Pew Internet Project Pew Research, November 8, 2012.

Fu, Yaqin and Ke Xiao, (2012). "Promoting sustainable e-government with multichannel service delivery: A case study." Software Engineering and Service Science (ICSESS), 2012 IEEE 3rd International Conference. Available from: (http://goo.gl/7ZdDG9).

GSMA (2012), "Shaping the Future—Realizing the potential of informal learning through mobile" GSM Association,2012.

Haiyan Qian, (2012). "Commonwealth Finance Ministers Report 2012". Commonwealth & Global Affairs, Economic Affairs: Trade, Economic Development.

Hesbon O. Nyagowa, Dennis N. Ocholla and Stephen M. Mutula (2012). "Evaluation of Success of NEPAD's Pilot e-Schools in Kenya: An overview." Information Studies Programme, University of Kwa-Zulu Natal South Africa. Available from: (http://goo.gl/mLiSsZ).

Hosman, Laura and Elizabeth Fife (2012). "The Use of Mobile Phones for Development in Africa: Top-Down-Meets-Bottom-Up Partnering." The Journal of Community Informatics 8, n. 3 (2012).

Howard, Alexander B. (2011). "Congress Weighs Deep Cuts to Funding for Federal Open Government Data Platforms". Govfresh (1 April 2011).

ICT works (2012). "We need affordable broadband for mLearning." May 04 2012 by Guest Writer. Available from: (http://goo.gl/9xeAlJ).

Informatics (2013). "The Promise of Mobile: Connecting to Underserved Populations." July 29, 2013.

IRIN (2013). "Analysis: Sending the right message on mHealth", 8 May 2013.

International Telecommunication Union (ITU) (2011), "The Role of ICT in Advancing Growth in Least Developed Countries—Trends, Challenges and Opportunities 2011".

- (2012a). "Measuring the Information Society. ICT development index 2011". Available from: (http://www.itu.int/ITU-D/ict/publications/idi/).

- (2012b). "Impact of Broadband in the Economy". Broadband Series. Telecommunication Development Sector (April 2012).

Jalote, Sumedha (2013). "Moldova Builds E-Government: Open Data". Asia Pacific FutureGov (26 July 2013). Available from: (http://goo.gl/Mf7EoA).

Koski, Heli (2011). "Does Marginal Cost Pricing of Public Sector Information Spur Firm Growth". EILA, Elinkeinoelaman Tutkimuslaitos, the Research Institute of the Finnish Economy. Keskusteluaiheita Discussion Papers (28 September 2011). no. 1260. Available from: (http://www.etla.fi/wp-content/uploads/2012/09/dp1260.pdf).

Kronrnburg, Tom (2011). "Data Journalism Fuelling PSI Re-use". European Public Sector Information Platform, Topic Report No. 2011/2 (October 2011). Available from: (http://epsiplatform.eu/sites/default/files/Topic%20Report%20Data%20Journalism.pdf).

Lauren Dawes, Revital Marom (2013), "Mobile Services for Youth Employment", GSM Association, Alcatel-Lucent.

Millard, J (2013) "ICT-enabled public sector innovation: trends and prospects". Proceedings of the 7th International Conference on Theory and Practice of Electronic Governance (ICEGOV2012), Seoul, Republic of Korea, 22 – 25 October 2013, the ACM Press.

Montagnier, P. and A. Wirthmann (2011), "Digital Divide:From Computer Access to Online Activities— A Micro Data Analysis", OECD Digital Economy Papers, No. 189, OECD. Available from: (http://dx.doi.org/10.1787/5kg0lk60rr30-en).

Morgan Stanley (2011). "Tablet Demand and Disruption". Morgan Stanley Research, February 2011.

New York Times (2013). "Most of U.S. Is Wired, but Millions Aren't Plugged In," August 18, 2013.

O'Reilly, Tim (2009). "Gov 2.0: It is all about platform." September 4, 2009, Techcrunch. Available from: (http://techcrunch.com/2009/09/04/gov-20-its-all-about-the-platform/).

OECD (2012), OECD Internet Economy Outlook 2012—Highlights.

- (2013a). "OECD Public Governance Reviews Colombia: Implementing Good Governance". Paris.

- (2013b). "e-Government Studies: Egypt 2012". Paris.

- (2013c). "Government at a Glance 2013—Preliminary Version."

OECD/International Telecommunication Union (2011), "M-Government: Mobile Technologies for Responsive Governments and Connected Societies", OECD Publishing. Available from: (http://dx.doi.org/10.1787/9789264118706-en).

OECD Newsroom (2012). "New SME policies needed to boost Latin America's growth, say OECD and ECLAC. OECD Development Center Newsroom". November 16 2012. Available from: (http://goo.gl/zSjdT0).

Ozburn, M. (2011). "Reaping the Trust Dividend: Federal Agencies Can Move Services Online now with an Identity Button (Like Facebook)—and Save Billions."Booz,Allen,Hamilton Ink 2011 Available from: (http://www.boozallen.com/media/file/Trust-Dividend-Booklet.pdf).

Pardo, Theresa A., Nam, Taewoo., & Burke, G Brian. (2012)."E-Government Interoperability: Interaction of Policy, Management, and Technology Dimensions". Social Science Computer Review, February 2012 30: 7-23, first published on January 12, 2011.

Porrua, Miguel A (2013). "E-Government in Latin America: A Review of the Success in Colombia, Uruguay and Panama", Organization for American States (2013), in the Global Information Technology Report 2013. World Economic Forum.

PricewaterhouseCoopers (PwC) (2009). "Champion for Digital Inclusion: The Economic Case for Digital Inclusion". 2009 PricewaterhouseCoopers LLP. Available from: (http://www.parliamentandinternet.org.uk/uploads/Final_report.pdf).

Prutsalis, Mark et al, (2010). "The Sahana Software Foundation Response to the 2010 Haiti Earthquake: A New Standard for Free and Open Source Disaster Management Systems". Proceedings of the 7 International ISCRAM Conference, Seattle, USA Available from: (http://wiki.sahanafoundation.org/lib/exe/fetch.php/iscram_2010_sahana_haiti.pdf).

R. Craig Lefebvre and Bornkessel, A.S. (2013). "Social Media as a Tool in Medicine - Digital Social Networks and Health".

Reddick, Christopher G. and Michael Turner (2012). "Channel choice and public service delivery in Canada: Comparing e-government to traditional service delivery" Government Information Quarterly, Volume 29, Issue 1, January 2012, Pages 1–11. Available from: (http://www.sciencedirect.com/science/article/pii/S0740624X11001080).

Regional School of Public Administration (ReSPA) (2013). "ReSPA Regional Comparative eGovernment Study and East Management." ReSPAAvailable from: (http://www.respaweb.eu/11/library#respa-publications-and-research-18).

Roelofsen, Occo and Sheng, Paul (2010). "Oil and gas: New sources of growth". Africa's path to growth: Sector by sector. McKinsey and Company Publications, June 2010.Available from: (http://goo.gl/1IhT3y).

Shkabatur, Jennifer (2012). "Towards Open Government for Enhanced Social Accountability." A collaboration of Open Development Technology Alliance, GAC in Projects and Social Development. World Bank 2012.

Smith, Craig Warren (2013). "Nine Digital Divide Truths." Digital Divide Institute. Available from: (http://www.digitaldivide.org/digital-divide-topics/nine-digital-divide-truths.html).

Stanford Social Innovation (2013). "Scale Can Happen: The MOTECH Experience." February 20, 2013.

Tauberer, Joshua (2012). "Open Government Data Definition: The 8 Principles of Open Government Data". Open Government Data (2012).

The Centre for International Governance Innovation and the Korea Development Institute (2012). "Post-2015 Development Agenda: Goals, Targets And Indicators—Special Report." The Centre for International Governance Innovation and the Korea Development Institute 2012. Available from: (https://www.cigionline.org/sites/default/files/MDG_Post_2015v3.pdf).

Turkish statistical institute (2013). "News Release: ICT usage Survey on households and individuals." 22 August 2013. Available from: (http://www.turkstat.gov.tr/PreHaberBultenleri.do?id=13569).

Ubaldi, Barbara (2011). "E-Government for the Economic Crisis." European Journal of ePractice 11.

United Nations (2013a). "Global Thematic Consultation on Governance and the Post-2015 Development Framework", p. 24. Available from: (http://www.beyond2015.org/sites/default/files/Governance.pdf).

- (2013b). "A new global partnership: The Report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda". Available from: (http://www.post2015hlp.org/wp-content/uploads/2013/05/UN-Report.pdf).

- (2013c) "A life of dignity for all: accelerating progress towards the Millennium Development Goals and advancing the United Nations development agenda beyond 2015". Report of the Secretary-General. 26 July 2013. A/68/202. Page 13. Para 84.

- (2013d). "Committee for Development Policy, Report of the 15th Session E/2013/33." Economic and Social Council Official Records. Available from: (http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N13/290/69/PDF/N1329069.pdf?OpenElement).

United Nations, 4th United Nations Conference on Least Developed Countries (2011). "Programme of Action for the Least Developed Countries for the Decade 2011–2020." Available from: (http://www.un.org/wcm/webdav/site/ldc/shared/documents/IPoA.pdf).

United Nations Children's Fund (UNICEF) (2012), "Project Mwana: Using mobile technology to improve early infant diagnosis of HIV", Zambia.

United Nations Department of Economic and Social Affairs (UNDESA) and ASPA (2001). "Benchmarking E-government: A Global Perspective". UNDESA/ASPA.

United Nations Department of Economic and Social Affairs (UNDESA) (2008) . "People Matter, Civic Engagement in Public Governance", World Public Sector Report 2008, United Nations.

- (2012) "*United Nations E-Government Survey* 2012." UNDESA 2012.

United Nations Development Group (UNDG) (2010a)."Thematic paper on MDG 3: Promote gender equality and empower women," March 2010. Available from: (http://www.oecd.org/social/gender-development/45341361.pdf).

- (2010b). "Thematic paper on MDG 7: Environment sustainability," 2010. Available from: (http://www.undg.org/docs/11421/MDG7_1954-UNDGMDG7-LR.pdf).

- (2013). "The global conversation begins: Emerging views for a new development agenda." 2013. Available from: (http://goo.gl/SMNVFy).

United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP) (2010). E/ESCAP/CICT(2)/L.2.

United Nations Economic and Social Commission for Latin America and the Caribbean (ECLAC) (2012). "Estrategias de TLC ante el desafío del cambio estructural en América Latina y el Caribe; Comisión Económica para América Latina y el Caribe (CEPAL)." Colección Documentos de proyectos; Naciones Unidas; Marzo 2013.

United Nations Economic and Social Commission for Western Asia (2013). "Citizen Engagement and the Post-2015 Development Agenda". Report of the Expert Group Meeting. ST/ESA/PAD/SER.E/191, E/ESCWA/ECRI/2013/WG.1/Report, p. 1.

United Nations Economic and Social Council (ECOSOC) Resolutions: E/RES/2005/3; E/RES/2006/47; E/RES/2007/38; E/RES/2008/32; E/RES/2009/18; E/RES/2011/2; E/RES/2011/22; E/RES/2012/28; E/RES/2013/2.

United Nations, General Assembly (1966). "International Covenant on Civil and Political Rights". 16 December 1966, United Nations, Treaty Series, vol. 999, p. 171. Available from: (http://www.unhcr.org/refworld/docid/3ae6b3aa0.html).

- (2000). "United Nations Millennium Declaration". 8 September 2000, United Nations, 55/2. Available from: (http://www.un.org/millennium/declaration/ares552e.htm).

- (2010). A/RES/65/2. Outcome Document of the High-Level Review Meeting on the Implementation of the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States. Available from: (http://goo.gl/inlHYF).

- (2012). "The Future We Want". A/RES/66/288. Available from: (http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/66/288&Lang=E).

The Universal Declaration of Human Rights (1948). Available from: (http://www.un.org/en/documents/udhr/).

WIPO (2013). "Global Innovation Index: The Local Dynamics of Innovation." Johnson Cornell University, INSEAD,WIPO 2013. Available from: (http://www.wipo.int/export/sites/www/freepublications/en/economics/gii/gii_2013.pdf).

Woodie, Alex (2013). "The Chief Data Officer's Time Has Come". Datanami (2 September 2013).

World Bank (2012). "Governments Can Save Up to 75% with Electronic Payment Program." August 2, 2012. Washington, D.C.

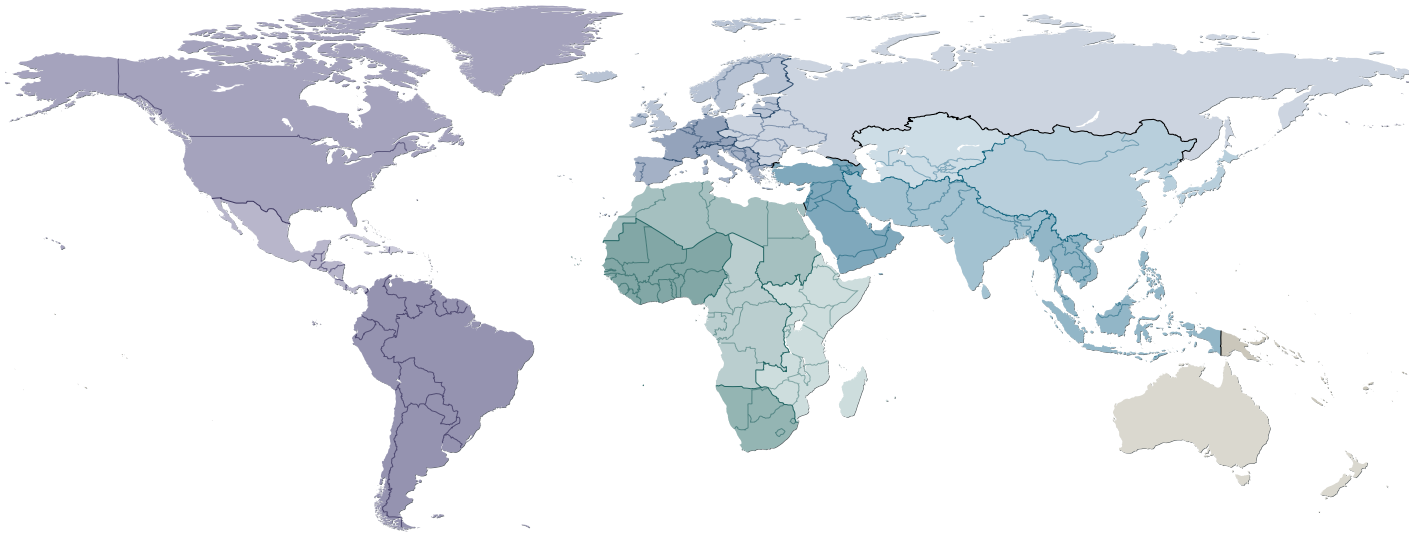
- (2012). "Information and Communication for Development: Extending Reach and Increasing Impact." Washington, D.C.

World Bank, African Development Bank and African Union (2012). "The Transformational Use of Information and Communication Technologies in Africa". Information and Communication Technologies, World Bank Group Available from: (http://go.worldbank.org/CXS4GFJDE0).

World Health Organization (2011). "New horizons for health through mobile technologies." Global Observatory for eHealth series 3. Geneva.

World Internet Project (2012). "International Report Fourth Edition". USC Annenberg School Center for the Digital Future. 2012. Available from: (http://goo.gl/9bgaUr).

Map 9.1 Regional groupings



Americas

Caribbean
- Antigua and Barbuda
- Bahamas
- Barbados
- Cuba
- Dominica
- Dominican Republic
- Grenada
- Haiti
- Jamaica
- Saint Kitts and Nevis
- Saint Lucia
- Saint Vincent and the Grenadines
- Trinidad and Tobago

Central America
- Belize
- Costa Rica
- El Salvador
- Guatemala
- Honduras
- Mexico
- Nicaragua
- Panama

Northern America
- Canada
- United States of America

South America
- Argentina
- Bolivia (Plurinational State of)
- Brazil
- Chile
- Colombia
- Ecuador
- Guyana
- Paraguay
- Peru
- Suriname
- Uruguay
- Venezuela (Bolivarian Republic of)

Europe

Eastern Europe
- Belarus
- Bulgaria
- Czech Republic
- Hungary
- Poland
- Republic of Moldova
- Romania
- Russian Federation
- Slovakia
- Ukraine

Northern Europe
- Denmark
- Estonia
- Finland
- Iceland
- Ireland
- Latvia
- Lithuania
- Norway
- Sweden
- United Kingdom of Great Britain and Northern Ireland

Southern Europe
- Albania
- Andorra
- Bosnia and Herzegovina
- Croatia
- Greece
- Italy
- Malta
- Montenegro
- Portugal
- San Marino
- Serbia
- Slovenia
- Spain
- TFYRO Macedonia

Western Europe
- Austria
- Belgium
- France
- Germany
- Liechtenstein
- Luxembourg
- Monaco
- Netherlands
- Switzerland

Africa

Eastern Africa
- Burundi
- Comoros
- Djibouti
- Eritrea
- Ethiopia
- Kenya
- Madagascar
- Malawi
- Mauritius
- Mozambique
- Rwanda
- Seychelles
- Somalia
- South Sudan
- Uganda
- United Republic of Tanzania
- Zambia
- Zimbabwe

Middle Africa
- Angola
- Cameroon
- Central African Republic
- Chad
- Congo
- Democratic Republic of the Congo
- Equatorial Guinea
- Gabon
- São Tomé and Príncipe

Northern Africa
- Algeria
- Egypt
- Libya
- Morocco
- Sudan
- Tunisia

Southern Africa
- Botswana
- Lesotho
- Namibia
- South Africa
- Swaziland

Western Africa
- Benin
- Burkina Faso
- Cape Verde
- Côte d'Ivoire
- Gambia
- Ghana
- Guinea
- Guinea-Bissau
- Liberia
- Mali
- Mauritania
- Niger
- Nigeria
- Senegal
- Sierra Leone
- Togo

Asia

Central Asia
- Kazakhstan
- Kyrgyzstan
- Tajikistan
- Turkmenistan
- Uzbekistan

Eastern Asia
- China
- Democratic People's Republic of Korea
- Japan
- Mongolia
- Republic of Korea

Southern Asia
- Afghanistan
- Bangladesh
- Bhutan
- India
- Iran (Islamic Republic of)
- Maldives
- Nepal
- Pakistan
- Sri Lanka

South-Eastern Asia
- Brunei Darussalam
- Cambodia
- Indonesia
- Lao People's Democratic Republic
- Malaysia
- Myanmar
- Philippines
- Singapore
- Thailand
- Timor-Leste
- Viet Nam

Western Asia
- Armenia
- Azerbaijan
- Bahrain
- Cyprus
- Georgia
- Iraq
- Israel
- Jordan
- Kuwait
- Lebanon
- Oman
- Qatar
- Saudi Arabia
- Syrian Arab Republic
- Turkey
- United Arab Emirates
- Yemen

Oceania

Australia and New Zealand
- Australia
- New Zealand

Melanesia
- Fiji
- Papua New Guinea
- Solomon Islands
- Vanuatu

Micronesia
- Kiribati
- Marshall Islands
- Micronesia (Federated States of)
- Nauru
- Palau

Polynesia
- Samoa
- Tonga
- Tuvalu

The United Nations E-Government Survey presents a systematic assessment of the use and potential of information and communication technologies (ICTs) to transform the public sector by enhancing its efficiency, effectiveness, transparency, accountability, as well as access to public services and citizen participation. By studying broad patterns of e-government around the world, the Survey assesses the e-government development status of the 193 United Nations Member States. It serves as a tool for decision-makers to identify their areas of strength and challenges in e-government to inform policies and strategies.

The 2014 Survey entitled "E-Government for the Future We Want" examines the global trends and emerging issues in e-government development. It also highlights the global progress in online service delivery and focuses on how to empower citizens through e-participation. In addition, it makes a case for the need of collaborative governance at all levels to promote sustainable development and underlines the importance of reaching out to citizens through mobile, social media and inclusive multichannel service strategies. The Survey also dwells on the challenge of the digital divide; posits that usage is central to delivering development impacts and suggests that open government data is a new development resource. The Report argues that Governments across the globe need to undertake a process of transformative change for the future we want. This, in turn, requires a transformation of government's role, functions, institutional frameworks and processes supported by the adoption of innovation and ICTs. E-government can thus contribute to a holistic transformation of the public sector in support of the post-2015 development agenda.

The United Nations E-Government Survey is produced by the United Nations Department of Economic and Social Affairs. The Department, through its Division for Public Administration and Development Management, has published this global report on e-government since 2003 and is regularly called upon to advise national administrations in all regions of the world on how to expand the use of ICTs in government to advance the internationally agreed development goals.

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