

Global Challenge

# Future of the Internet Internet for All

Prepared in collaboration with the Boston Consulting Group



The Forum is placing institutional emphasis on addressing a set of global challenges whose resolution is contingent on expanded forms of collaboration. The Future of the Internet initiative seeks to optimize the effectiveness of cooperation and problem-solving through dialogue and collective action by leveraging the Forum's interdisciplinary platform for leadership.

**Internet for All** is one of the core projects of the Future of the Internet initiative. As a critical enabler of the Fourth Industrial Revolution, Internet for All focuses on connecting the over 4 billion people not connected to the internet. The project's core objective is to develop scalable, replicable, public-private collaboration models to accelerate internet access and adoption at the national, regional and global levels.

In 2015, Internet for All convened stakeholders from various backgrounds to collect successful practice examples for global internet access and adoption, and to develop a framework in which to accelerate achieving "internet for all". Through research, interviews and working sessions, the framework emphasizes the need for an ecosystem approach to simultaneously address the challenges related to

infrastructure, affordability, skills and awareness, and content. The results will be published in a report on *Internet for All – A Framework for Accelerating Internet Access and Adoption*. In 2016, Internet for All has two main objectives:

- **To develop new scalable and replicable on-the-ground models of public-private collaboration**, in partnership with governments, to accelerate the achievement of the broader social and economic priorities of the country/region in the context of accelerating internet for all. Programmes will be launched in initially up to three countries/regions. The Northern Corridor countries in East Africa (Rwanda, Uganda, Kenya, and South Sudan) will be the first such programme, and additional country program partnership opportunities in Asia and Latin America will also be explored.
- **To develop a physical and digital platform that results in increased coordination and collaboration** among the multiple private, bilateral/multilateral, and non-profit organizations involved in catalysing internet access and adoption at the global, regional, and country level.

## Executive Summary

### *Internet for All – A Framework for Accelerating Internet Access and Adoption*

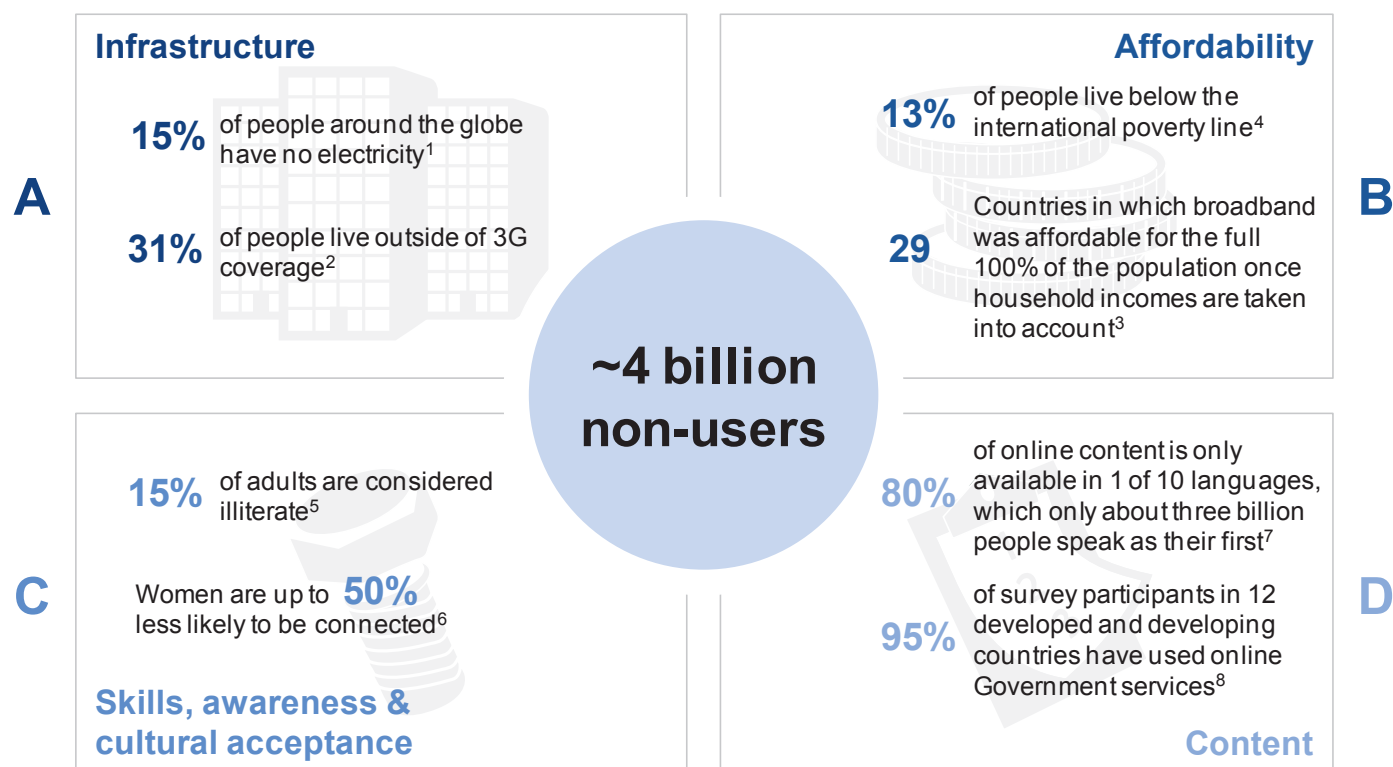
The Internet has become a pervasive, fundamental part of daily life, and it continues to deliver massive economic and social benefits around the world. Yet some 4 billion people – more than 55% of the world's population – are still not online. Many simply do not have access: they live in hard-to-reach rural areas or they do not have access to digital or other basic infrastructure. Some do not see the benefits of getting connected, often because of limited relevant digital content. Others are illiterate. Many are poor. Inequality – whether of gender, income or other factors – compounds the challenge.

Governments, companies, local and international organizations and members of civil society are working to extend Internet access and use, and plenty of progress has been made since people first started taking about a “digital divide” with respect to the Internet some 15 years ago. But the challenge is huge, complex and multidimensional. As the International Organization for Public-Private Cooperation, the World Economic Forum brings together multistakeholders including policy-makers, business and civil society leaders and experts to undertake a comprehensive analysis of the issues related to Internet access and use for all, and recommend solutions.

The barriers to greater Internet use fall into four categories: infrastructure, affordability, skills and awareness, and local adoption, which is often an issue of lack of local content. By segmenting the barriers countries need to overcome, the highest hurdles can be identified in regions and countries, allowing examination of the solutions that have been successful (or made progress) in the context of common economic, geographic and other conditions.

The report includes a checklist (see Appendix for full list) to help policy-makers and others assess where their countries currently stand and the kinds of initiatives to consider. It is the Forum's intention to use this work and checklist in the country programmes planned. Following a detailed analysis of the status quo in a country, the checklist can help identify existing strengths as well as gaps and unevaluated ideas. The resulting proposals of possible initiatives should be detailed and tailored to local circumstances and various stakeholders, led by the local government and authorities, should collaborate to take such initiatives. The Forum aims to catalyse and coordinate stakeholders in this effort and to generate and sustain the momentum needed to make these initiatives a success.

Fig 1: Overview of the Internet for All framework showing the four categories of barriers to internet adoption



Most recently available figures used: 1. World Bank, 2012; 2. ITU, 2015 estimate; 3. The Broadband Commission, State of Broadband Report, 2015; 4. World Bank, 2015 (2012 data); 5. Adults UNESCO, 2015; 6. Controlling for education level and household income, World Wide Web Foundation, 2015; 7. World Bank, 2014; 8. BCG, 2014  
Source: World Bank; ITU; Katz & Callorda; UNESCO; World Wide Web Foundation; BCG

**Infrastructure is a major hurdle for many countries, particularly those with large rural or remote populations and those that are poor. Many developing markets require massive investment to move up to more advanced mobile technologies.**

- Governments can facilitate and encourage infrastructure investment when they have a clear long-term plan for the economy, a transparent regulatory framework, and a tax system that incentivizes investment. The GSMA's most recent annual study on taxation and the mobile industry found that "total tax payments and fees are estimated to represent more than a third of market revenues for 11 of the 26 countries surveyed. Total mobile tax payments from taxation on both consumers and operators are estimated to range from 10.6% as a proportion of market revenues in Nigeria to 58.3% in Turkey<sup>1</sup>. Many have successfully employed both digital strategies and national broadband plans. National broadband plans have a big impact. Research by the Broadband Commission for Digital Development, the ITU, and Cisco Systems shows that such plans lead to 7.4% higher mobile Internet penetration, on average<sup>2</sup>.
- Regulatory policy and decisions have significant impact on infrastructure investment, with respect to both scarce mobile spectrum and fixed line networks. Colombia, for example, lowered barriers for new broadband market entrants in 2009. Today, five network operators and six virtual network operators compete in the country. Prices decreased for entry-level broadband plans from 5.8% of per capita average income in 2013 to 3.3% in 2014.<sup>3</sup>
- Given the substantial investment required for some projects, international cooperation among countries and cooperation between the public and private sectors is an important condition of achieving global connectivity, particularly for the most fundamental infrastructure. Undersea fiber cables that provide fundamental connections for entire nations are one part of the solution. For example, the 5,000 kilometer fiber-optic East African Marine System (TEAMS), which connects Kenya to the United Arab Emirates, has been operating since 2009. The undersea cable not only augments South Africa's EASSy submarine fiber optic cable system, but it also connects the Kenya national fiber backbone network to neighbouring countries Uganda, Rwanda, Burundi and Tanzania through cross-border connectivity arrangements.<sup>4</sup>
- Innovation in technology and business models, among other areas, has repeatedly demonstrated to be a powerful barrier breaker. When it comes to investing in infrastructure for more remote areas, a more flexible and experimental approach to service offering and regulating services may be needed to help unlock the financial incentives that the private sector needs when there is no clear business case based on voice and data charges alone. Some companies are exploring the potential to solve coverage issues using satellites, balloons or stratospheric solar planes.

#### Checklist: Selected questions on Infrastructure

- How does the policy and regulatory environment encourage competition as well balance targets to stimulate investment and innovation and consumer welfare?
- What is the current status of spectrum availability and what are the current allocation/reallocation/spectrum management plans? Do spectrum allocation plans include the possibility to allocate unlicensed spectrum? How does spectrum policy strike a balance between the goals of raising revenue and advancing access?
- Which non-ICT infrastructure projects (e.g., transportation or electricity) are under way, and do coordinating mechanisms among different initiatives exist to benefit from synergies in construction efforts?
- Does public policy encourage a flexible and experimental approach to service offerings and regulating services, particularly in areas where there is no clear business case for infrastructure investment based on voice and data charges?



<sup>1</sup> See GSMA and Deloitte, 2015, Digital Inclusion and mobile sector taxation 2015

<sup>2</sup> Broadband Commission for Digital Development, ITU and Cisco, 2013, Planning for Progress: Why National Broadband Plans Matter

<sup>3</sup> Alliance for Affordable Internet, 2014a, Affordability Report 2014

<sup>4</sup> The East African Marine System Limited, 2014, The East African Marine System (Teams). Retrieved 1 February 2016, from <http://www.teams.co.ke>

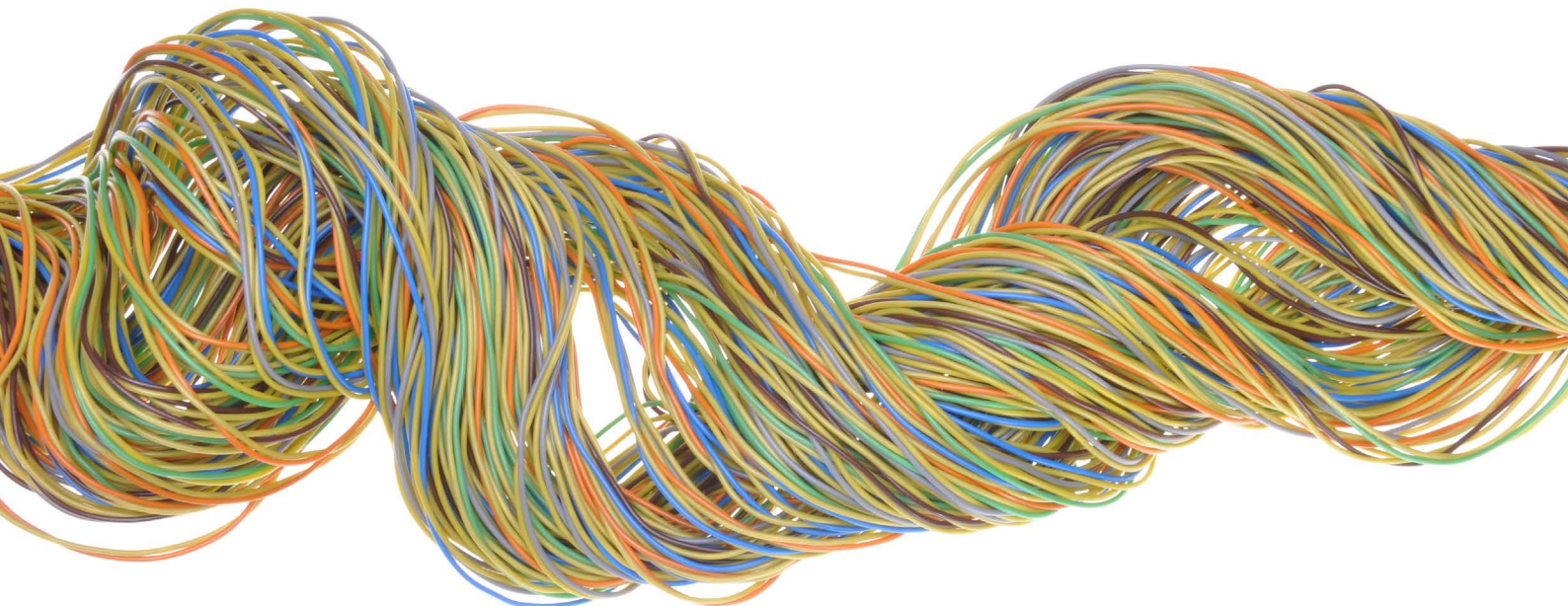


**Affordability remains a significant constraint, both for the more than 14% of people who live under the international poverty line and for those who find the cost of both devices and access too high or do not perceive sufficient value for money from Internet use.**

- Although the cost of smartphones has fallen significantly, it is still out of reach for many. The cost of fixed line or mobile access in emerging markets can also be high for low-income inhabitants – it is often well above the affordability threshold of 5% of average income set by the UN. Affordability strikes some segments of the population disproportionately, notably women and rural residents.
- Government policy in a number of areas, namely taxation, can have a direct impact on cost. In April 2014, Brazil extended tax breaks on computers and other digital devices that were set to expire at the end of the year until 2018. While the Finance Ministry estimated it would forego some 7.9 billion reais (\$3.5 billion) in tax revenues in 2015, it considered that the cost of the tax break was “more than compensated by an increase in output, sales and employment in the sector.”<sup>5</sup>
- Device manufacturers and operating system companies, including some new players, are making progress. The downward trend in smartphone prices, especially in emerging markets, is a welcome development and set to continue. Phones priced below \$100 made up only about 20% of smartphone shipments in 2013, but today a large and growing range of companies is making affordable phones, including global manufacturers (Samsung, HTC), local players (Xiaomi, Micromax), and new entrants (Mozilla/Intex).
- Some organizations are applying new business models to extend affordable access. Using other revenue pools to cross-subsidize services as well as bundling different services together can inspire new ideas. For example, the mCent app by Jana, a mobile startup, provides free services in markets where people have difficulty affording online access. The mCent app uses a sponsored data model, offering users free airtime in return for trying out the apps or products of its advertisers. Jana partners with more than 300 mobile operators in 93 countries; mCent has some 40 million users.<sup>6</sup>

#### **Checklist: Selected questions on Affordability**

- What taxes (e.g., VAT, duties on handsets) affect consumer prices and to what extent? Do tax structures reflect the imperative of Internet access as a necessity in today's world (in other words, are the objectives of the ICT and finance ministries aligned)?
- What barriers may need to be removed to incentivize the private sector and civil society to explore new models (such as allowing flexible fees models, zero-rating models and bundling options)?
- What targeted initiatives have been considered for subsections of the population that may be underserved (e.g., women, farmers, youth, rural residents, the handicapped)?



<sup>5</sup> Reuters, 2014, Brazil extends tax breaks on computer, smartphone sales. Retrieved 1 February 2016, from <http://www.reuters.com/article/brazil-economy-taxbreaks-idUSL2N0QR1LA20140821>

<sup>6</sup> Forbes, 2015, This App Is Cashing In On Giving The World Free Data. Retrieved 1 February 2016 from <http://www.forbes.com/sites/parmyolson/2015/07/29/jana-mobile-data-facebook-internet-org/#7cd8a9a929a6>

**Research shows that lack of skills and awareness is one of the greatest barriers to Internet adoption and use. In many countries, basic literacy is lacking. But even where there is not literacy-related issue, lack of awareness among non-users of the value of the internet remains a formidable hurdle.**

- Top priorities include: Spreading awareness of the value of the Internet, encouraging its cultural acceptance and helping people acquire the skills to go online. These efforts need to be based on a sharp understanding of local conditions and customs, especially how families and communities influence teaching and exposure to new ideas.
- Governments, private sector players, civil society and local and international organizations can all combine to promote basic skills building, which can take place in both formal and informal frameworks.
- For widespread digital usage to take hold and digital economies to grow, governments need to address literacy and education enrollment issues. Advanced ICT skills are key to putting the Internet to work in businesses and developing digital economies. ICT tools can also be used to spread and enhance learning in other subjects, such as language, mathematics and the sciences, thus advancing both general and ICT-specific education and skills building.
- Connected facilities in remote or hard-to-reach regions can provide centralized venues for communities to be exposed to the benefits of Internet access. In Kenya, Uganda and Tanzania, the Arid Lands Information Network (ALIN) has been establishing Maarifa Centres – often using shipping containers adapted for the purpose – and since 2007 providing ICT equipment in some of the world's most remote areas.
- Individuals and communities that become connected find enormous value, and a world of information and assistance. The latter often comes from international communities or civil society organizations or institutions committed to using the Internet to expand ICT skills. In a number of countries around the world, CoderDojo, a grass roots organization founded in Ireland in 2011, oversees a global volunteer-led community of free programming clubs for people between ages 7 and 17. Young people in disparate locations can explore and learn technology together and receive support from skilled mentors. Users create apps, websites and games. More than 880 dojos operate today, mostly in developed urban centres, but there are also dojos in developing countries: India, for example, has 10 and Madagascar four.

#### **Checklist: Selected questions on Skills & Awareness**

- What current initiatives in the education system promote and facilitate acquisition of ICT skills and encourage Internet use? Does the educational system offer formal training in ICT skills? What is the extent of usage of ICT tools in teaching other subjects, such as languages, math, and sciences?
- What cultural conditions affect the use and adoption of new trends? What target groups need to be addressed in a particular way?
- Are schools wired for ICT access all the way to the classroom?
- In what ways can the awareness of free, international resources for training be promoted? What barriers need to be removed for their widespread adoption?

**Digital ecosystems that produce local content and apps are vital for building digital literacy, attracting local users and serving local needs. Digital services also can contribute to addressing local problems and boosting competition in an increasingly international digital services market. In addition, using the Internet can have a substantial impact on local businesses, especially small and medium-sized enterprises.**

- The public and private sectors can encourage adoption and use by facilitating local content development and putting in place policies that make it easier for businesses, especially SMEs, to benefit from digital technology.
- One of the most powerful steps that governments can take is to digitize to the full extent possible their interactions with their citizenries and the provision of government services. Governments also play a direct role in promoting content development by others. Some are encouraging local private-sector ICT development by including local businesses in government procurement and e-services programs. Programs such as these are major drivers of usage. A 2014 BCG survey in 12 developed and developing countries found that almost 95% of the respondents had used at least one online government service in the last two years. An average of 32% used online government services more than once a week. The survey also found that users in developing countries access more services online and access them more frequently.<sup>7</sup> Kenya, Australia, South Korea, Singapore and Rwanda, among other nations, are all experimenting with ways to streamline and simplify access to government websites. French users can access some 30 services with a single user name and password. Some 2 million Australians have a myGov account. Singapore's SingPass programme provides a single online authentication system through which users can access 270 different services from 58 government agencies. SingPass has a more than 90% use rate.



<sup>7</sup> The Boston Consulting Group. (2014a, June 05). Digital Government: Turning the Rhetoric into Reality



- The private sector can not only contribute to content development, but also profit directly from its efforts. As economies expand and incomes rise, the experience of countries such as India and Brazil shows that the Internet – and particularly the mobile Internet – are powerful vehicles for commerce in places where physical retail infrastructure remains underdeveloped.
- Far-sighted companies and organizations are facilitating content development by others by helping to incubate new ideas and provide necessary wrap-around services to would-be content creators. Founded in 2011, AfriLabs is a pan-African network of 40 technology innovation hubs in 20 countries. It seeks “to build a community around rapidly emerging tech hubs – spaces that serve as physical nexus points for developers, entrepreneurs and investors.”<sup>8</sup> Setting up incubators and providing financial and business support to entrepreneurs is a promising path on which to build sustainable content development capabilities. Many of the services and applications developed address local problems.
- SMEs drive Internet usage and boost their countries’ economies (as well as their own businesses) when they add websites and mobile apps and, as a result, increase revenues and growth.

These four issues are interdependent and need to be addressed in a comprehensive manner. Although many successful practices can be found globally, there is no “one-size-fits-all” solution to any of them. Each country or region will need to identify the set of problems before it and develop an orchestrated approach, based in part on learning from what has worked elsewhere, to address the relevant issues.

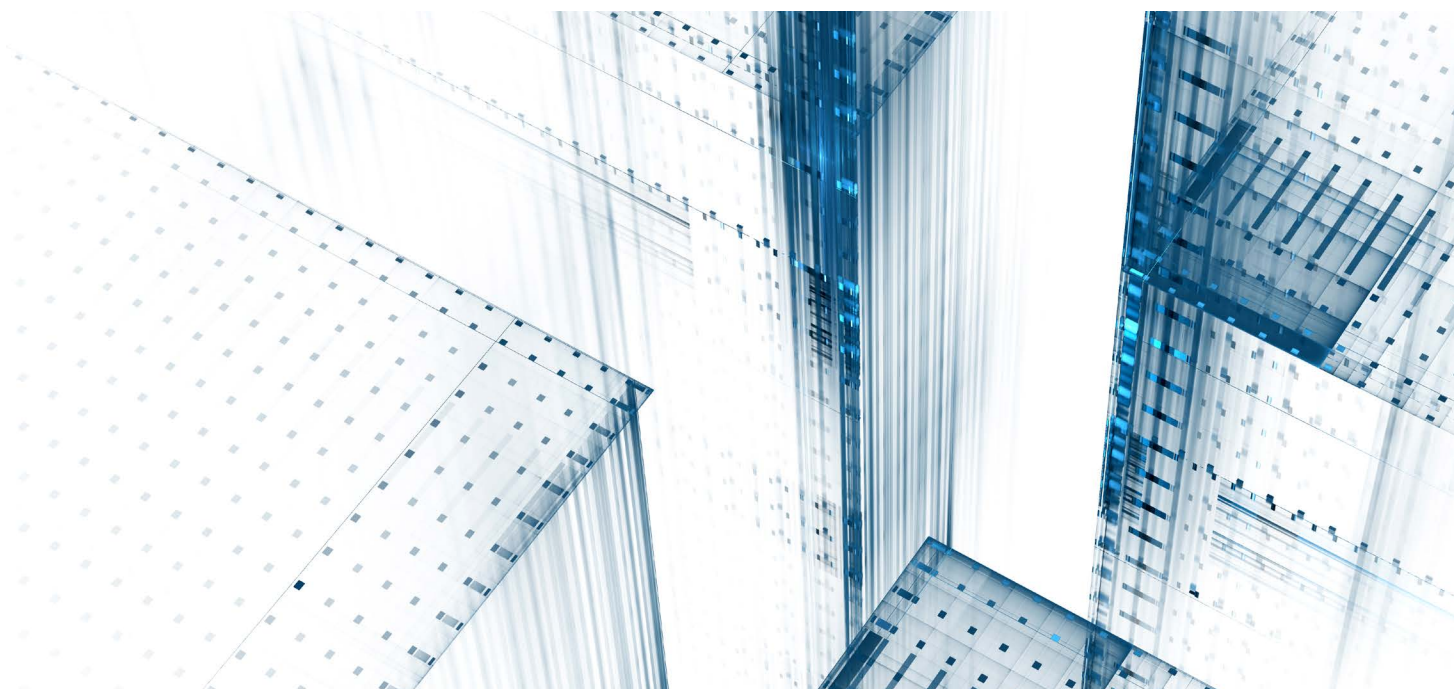
The barriers are real and the costs are significant. But policy-makers and others may want to ask themselves what would be the costs inaction, of not extending access and use. These are high as well, and potentially much higher in terms fewer jobs and less economic development, a larger digital divide, poorer education, worse healthcare and lower life expectancy – among many other factors.

For more information, please contact  
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To download the full **Internet for All Framework Accelerating Internet Access Adoption report**, please see [http://www3.weforum.org/docs/WEF\\_Internet\\_for\\_All\\_Framework\\_Accelerating\\_Internet\\_Access\\_Adoption\\_report\\_2016.pdf](http://www3.weforum.org/docs/WEF_Internet_for_All_Framework_Accelerating_Internet_Access_Adoption_report_2016.pdf)

#### Checklist: Selected questions on Local Content

- Has the government charged all relevant ministries, departments and agencies (e.g., health, education, labour, treasury, and others) with bringing services and programmes online?
- Are regulation and policy supportive of developing innovative digital solutions for basic services (e.g., mobile money, insurances, etc.)? Is the government itself at the forefront of using such innovative services (e.g., for public-sector employee salaries)?
- What are the relevant “use-cases” for the population – i.e., what kinds of local content have the greatest impact on improving individual livelihood? What relevant “use-cases” are most likely to constitute an on-ramp to the Internet and encourage first-time use?
- What kind of programmes or incentives encourage wider use of the Internet by SMEs?



<sup>8</sup> AfriLabs. (n.a.). *AfriLabs*. Retrieved February 02, 2016, from <http://afrilabs.com/>

# Appendix

## A Checklist for Making Progress

How do governments, companies, organizations and others move forward? The checklist below proposes questions that can help public- and private-sector institutions and organizations as well as NGOs, foundations, academic and research institutions, and members of civil society to assess where they and their countries stand. While the checklist is not intended to be comprehensive or prescriptive, it does point to the kinds of initiatives they need to consider with respect to each of the four issues at hand: extending infrastructure, tackling affordability, building skills and awareness, and promoting local adoption and usage.

It is the Forum's intention to use this work and checklist in the country programmes planned for 2016. First, a detailed analysis of the status quo in the countries should take place. The checklist can help to identify existing strengths as well as gaps and unevaluated ideas. Next, the resulting list of possible initiatives should be detailed and tailored to the local circumstances. Various stakeholders, led by the local government and authorities, should collaborate to take such ideas into action. The Forum aims to catalyse and coordinate stakeholders in this effort to help generate and sustain the momentum to make these initiatives a success.

### 1.1 Overall

- What is the country's current national Internet or digital economy or broadband development strategy or plan?
- What is the extent of involvement of various relevant government departments, ministries and agencies in the existing plan and initiatives?
- How are the private sector, industry bodies, national and international organizations, and civil society involved in the plan's development and implementation?
- What measurable goals and milestones have been set and what responsibilities allocated in the four key areas of infrastructure deployment, affordability, spreading skills and awareness, and promoting local content and usage so that progress that can be monitored and adjustments made?

### 1.2 Infrastructure

#### Public Sector Policy:

- How does the policy and regulatory environment encourage competition as well balance targets to stimulate investment and innovation and consumer welfare?
- Has the government explored privatization of publicly owned telecommunications assets?
- Which viable solutions to solving complementary problems (such as electricity) are being explored?
- What tax levels do network operators face and have they been reviewed in light of advancing connectivity? (e.g., corporate tax, revenue based contributions, annual regulatory fees, annual spectrum fees, etc.) Are there tax incentives in place to accelerate internet deployment (e.g., accelerated depreciation for connectivity infrastructure investments, R&D tax

credits to promote infrastructure innovation or other tax credits)?

#### Regulatory Policy:

- What is the current status of spectrum availability and what are the current allocation/reallocation/spectrum management plans? Do spectrum allocation plans include the possibility to allocate unlicensed spectrum? How does spectrum policy strike a balance between the goals of raising revenue and advancing access? How are spectrum auction winners evaluated? (e.g., on bid price, speed of build out, etc) Is a spectrum shortage evaluation conducted periodically?
- How do the relevant authorities ensure the regulatory framework is perceived as credible and consistent over time enough to encourage the private sector to commit to investing in infrastructure projects?
- Is regulation technology neutral as well as flexible enough to allow for sharing-models in infrastructure and spectrum use?

#### Multiparty cooperation and coordination:

- Which non-ICT infrastructure projects (e.g., transportation or electricity) are under way, and do coordinating mechanisms among different initiatives exist to benefit from synergies in construction efforts?
- Which options have been explored for regional cooperation models with public or private organizations across countries?
- What collaboration mechanisms exist among ministries to fund and benefit from extending access (e.g., the positive impact of greater connectivity on law enforcement, education, healthcare, agriculture, etc.)?

#### Other solutions:

- What examples of the latest technological advances have been encouraged and explored in trials (e.g., allowing experiments with balloons, planes, etc.)? Are efficient regulatory frameworks in place to allow for such trials?
- Does public policy encourage a flexible and experimental approach to service offerings and regulating services, especially in areas where there is no clear business case for infrastructure investment based on voice and data charges alone?

### 1.3 Affordability

#### Public policy and regulation:

- What sustainable, targeted ways to offer subsidized devices and services without disrupting market incentives are being explored?
- Which regional solutions, such as the abolition of roaming charges, have been considered?
- What taxes (e.g., VAT, duties on handsets) affect consumer prices and to what extent? Do tax structures reflect the imperative of Internet access as a necessity in today's world (or put another way, are the objectives of the ICT and finance ministries aligned)?
- What targeted initiatives have been considered to address the underserved population (e.g., women, farmers, youth, rural residents, the handicapped)?

### Private sector and civil society involvement:

- How does commerce take place and what does it imply for provision of goods and services (elements of an exchange economy, role of communities and market-places, access to other goods and services)?
- What barriers may need to be removed to incentivize the private sector and civil society to explore new models (such as allowing flexible fees models, zero-rating models and bundling options)?

## 1.4 Skills and Awareness

### National education curricula:

- What current initiatives in the educational system promote and facilitate acquisition of ICT skills and encourage Internet use? Does the education system offer formal training in ICT skills? What is the extent of usage of ICT tools in teaching other subjects, such as languages, math and sciences?
- What initiatives are planned or under way to prepare educators and public officials to facilitate acquisition of ICT skills and adoption of Internet use?

### Enabling communities and families:

- What cultural conditions affect the use and adoption of new trends? Do specific target groups need to be addressed in a particular way?
- What are typical information sources for people and how does news spread?

### Establishing local facilities:

- Are schools wired for ICT access all the way to the classroom?
- What population groups, in which areas, are particularly unaware and/or unskilled? Are they being addressed with individualized initiatives?
- What local circumstances exist to facilitate, or be the vehicle for, teaching and learning? (e.g., the availability of libraries, schools, community centres)?
- How many localized initiatives exist and is there best-practice exchange among them?

### From Skills to Jobs:

- How is awareness promoted of free, international resources for training? What barriers need to be removed for their widespread adoption?

## 1.5 Encouraging Local Adoption and Use

### Government

- Has the government charged all relevant ministries, departments and agencies (e.g., health, education, labor, treasury, etc.) with bringing services and programmes online?
- Is local, private-sector ICT development encouraged by including local businesses in government procurement and e-services programmes?
- Is regulation and policy supportive of developing innovative digital solutions for basic services (e.g., mobile money, insurances, etc.)? Is the government itself at the forefront of using such innovative services (e.g., for public sector employee salaries)?
- Does the legal framework promote content creation and dissemination by protecting freedom of expression, and using technology to promote openness and transparency?
- Is government striking a balance between net neutrality concerns and business model innovation in providing content (e.g., sponsored data)?

### Private sector and civil society:

- What cultural conditions (familiarity with the English language; variety of population groups and dialects) are present in different areas?
- What steps are required to start a new business? Can unnecessary hurdles be removed?
- What are the relevant “use-cases” for the population – i.e., what kinds of local content have the greatest impact on improving individual livelihood? What relevant “use-cases” are most likely to constitute an on-ramp to the Internet and encourage first time use? What relevant “use-cases” are prone to expand the population’s engagement and encourage more profound Internet use, including content or business creation by individuals?
- What is being done by various stakeholders (public, private and civil society) to establish entrepreneurial clusters? What is the economic and legal environment for content creation and hosting? For entrepreneurship (the ease of starting a business and access to credit, for example)? What kinds of programmes encourage wider entrepreneurial local app development?
- What kinds of programmes or incentives encourage wider use of the Internet by SMEs?

