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The Inclusive Internet Index:

Bridging digital divides

Contents

Executive summary

Twenty years after the internet began to change people's lives, less than half of the world's population is able to benefit from it. Even in some developed countries, up to one-fifth of the population is still offline, either unable to use the internet or unconvinced of its value.

The ranks of the unconnected are far larger in the developing world. As the developed world becomes ever more active online, the persistence of digital divides is likely to constrain poorer countries' development.

The burgeoning use of mobile phones across the developing world has been an equaliser of sorts, enabling internet access to millions who would otherwise be excluded. Connectivity alone, however, is not enough to ensure that people are able to benefit from the internet. As this study argues, the internet must also be relevant, and people must have the skills and confidence to use it. An inclusive internet, in other words, is widely available, affordable and allows usage that promotes positive social and economic outcomes. Inclusion may be defined as the sum of actions taken by government, commercial firms and civic organisations in a country to make this a reality.

The Inclusive Internet Index assesses the enabling environment for the adoption and beneficial use of the internet in 75 countries. It finds that, while high levels of wealth and economic development contribute much to a strongly inclusive environment, several middle-income countries are successfully building key enablers, such as relevant content, digital literacy and policy. This shows that countries with lower levels of economic development nevertheless have levers with which to boost internet inclusion available to them.

Key findings from the study include:

There is more to inclusion than internet availability. Most of the world's leaders in building connectivity are also strong in supporting the other enablers of internet inclusion, namely Affordability, Relevance and Readiness. There are exceptions, however. The US is 10th in the Availability category, but 3rd in the overall Index, on the strength of high rankings in Affordability, Relevance and Readiness. Chile and Brazil make the overall top 20 thanks to relatively strong performances in categories such as Affordability or Relevance, but not in Availability. Conversely, the overall Index co-leader, Singapore, performs strongly in Availability but trails several other countries in the other categories—a reminder that inclusion starts with widescale internet availability.

Middle-income countries outperform rich ones in some areas of inclusion. Malaysia, for example, leads the pack in the Readiness category of the Index, and Kazakhstan and Argentina also compare favourably with many wealthier countries here. Their success in developing digital policy partly explains this, but they also earn good marks for expanding digital literacy and education. Russia and Brazil outperform several high-income countries in the local relevance of internet content.

Local content is abundant in non-English-speaking countries. Only one native English-speaking country (the US) ranks in the top ten in local content. English may be the dominant language of the internet, but non-English-speaking countries in both the developed and the developing world have made considerable progress in ensuring that domestic internet users have content available to them in their country's primary language. Several countries are tied for first place in this category, including China, Poland, Ukraine, Sri Lanka, Brazil, Russia and Vietnam.

Nepal, Tanzania and Senegal are the best-performing low-income countries in enabling internet inclusion. Nepal's leadership of this group is due to its development of national e-inclusion strategies and related policies and better comparative performance in Availability. Tanzania's performance is largely attributable to its efforts to improve digital literacy and its development of data privacy regulations, while Senegal's success reflects its initiatives to expand public WiFi access.

Taiwan, Spain and the UK lead the world in ensuring that women can connect to the internet. Singapore and five other developed countries—Australia, Canada, the Netherlands, Italy and Sweden (the overall Index co-leader along with Singapore)—follow closely behind. However, the Index confirms the yawning gap between the developed and the developing world when it comes to boosting female inclusion: virtually the entire bottom half of the table in female internet access is populated by lower-middle-income and low-income countries.

Internet exchange points (IXPs) can enable local content growth, but not by themselves. Lower-income countries in Africa and Asia struggle to build the capacity to host internet content. It is no coincidence that most of the same countries figure in the lower half of the Index in both the prevalence of IXPs and the availability of local content. Yet the existence of a local IXP is no guarantee of accumulating a critical mass of content. Existing local content may be in short supply in low-income countries, and content sourced from overseas is likely to be costly.

Foreword by Internet.org

Internet access drives economic opportunity and enables the free exchange of data and information. It provides tools to address some of our biggest global challenges, including delivering education and healthcare, sourcing clean water, increasing energy efficiency, and making government more effective and responsive to the needs of its citizens. In other words, connectivity is not just a by-product of progress—it is also a crucial enabler.

To achieve universal connectivity, individuals, communities and countries need accurate information about what they have to do to connect to and benefit from the internet. For this reason, Facebook's *State of Connectivity 2015* report called on governments, companies, academics and organisations to gather better and more accurate data about the internet and address the barriers to achieving universal connectivity.

For this year's study, we commissioned The Economist Intelligence Unit (EIU) to bring together data from as wide a range of sources as possible to create a comprehensive index of internet inclusion. We hope that these new data will catalyse action by informing the design, implementation and evaluation of policies across the public and private sectors, so that the whole world can benefit from being online. Indeed, we see this as the first step towards creating an open data commons as a public good that addresses connectivity and use of the internet.

Creating an inclusive digitally connected society is a lofty challenge and must be grounded in evidence. In a world with competing ideas, having common baseline facts leads to better decisions by enabling us to test propositions and learn from experiences. For example, new data from researchers at Facebook show that women in developing countries are not only less likely to have data-capable phones than men, but they also are less likely to have even heard of the internet.

The future of the digital society and culture is too important not to have a common set of data to make and evaluate decisions.

The Inclusive Internet Index is a public good, open to anyone, anywhere. We've created a variety of mechanisms for accessing the data, so that the insights are available to people at all levels of analytical/technical expertise and interest. The data can be visualised using a straightforward tool in the online hub. Alternatively, anyone can download the data to run their own analyses. We know that data only become valuable when they are converted into insights based on thoughtful analysis. For this reason, Internet.org has commissioned The EIU to produce a series of briefings

that highlight key takeaways across countries and regions.

This is just the beginning. We invite everyone to conduct and share their own analyses and, in the future, contribute data to this effort. We hope that, as a community, we can create an accurate, comprehensive, time-series dataset on global internet access, use and benefits to foster evidence-based decision-making that will move us closer to a truly inclusive, connected world.

About the report

The Inclusive Internet Index: Bridging digital divides is an Economist Intelligence Unit report, commissioned by Internet.org. The analysis in the report is based on an index built by The Economist Intelligence Unit's editorial team as well as a series of in-depth interviews we conducted with experts in the subject matter from around the world.

The project has benefited from counsel provided at various stages by a panel of experts consisting of the following authorities on internet inclusion (listed alphabetically):

- Gary Fowlie, head, ITU Liaison Office to the United Nations, International Telecommunication Union

- Antonio García Zaballos, lead specialist, telecommunications, Inter-American Development Bank

- John Garrity, senior connectivity adviser, United States Agency for International Development (USAID)

- Steven Huter, director, Network Startup Resource Centre, University of Oregon

- An Xiao Mina, research fellow, Berkman Klein Center for Internet & Society, Harvard University

- Robert Pepper, head of global connectivity policy and planning, Facebook

- Juliana Rotich, co-founder, BRCK

- Basheerhamad Shadrach, Asia co-ordinator, Alliance for Affordable Internet

- Alex Wong, head, Global Challenge Partnerships and member of the Executive Committee, World Economic Forum

Interviews were also conducted with:

- Dawit Bekele, director, Africa Regional Bureau, Internet Society

- Doreen Bogdan-Martin, chief of strategic planning, International Telecommunication Union

- William Dutton, professor of media and information policy, Michigan State University

- Doyle Gallegos, global lead, Broadband Access for All, World Bank Group

- Michael Kende, senior adviser, Analysys Mason

- Elisa Lironi, digital democracy manager, European Citizen Action Service

- James Manyika, director, McKinsey Global Institute

- Eunice Musiime, executive director, Akina Mama wa Afrika

- Nilanjan Raghunath, assistant professor, Singapore University of Technology and Design

- Dhanaraj Thakur, research manager, Alliance for Affordable Internet

- Maria Umar, founder and president, Women's Digital League

- Tim Unwin, UNESCO chair in ICT4D and emeritus professor of geography, Royal Holloway, University of London

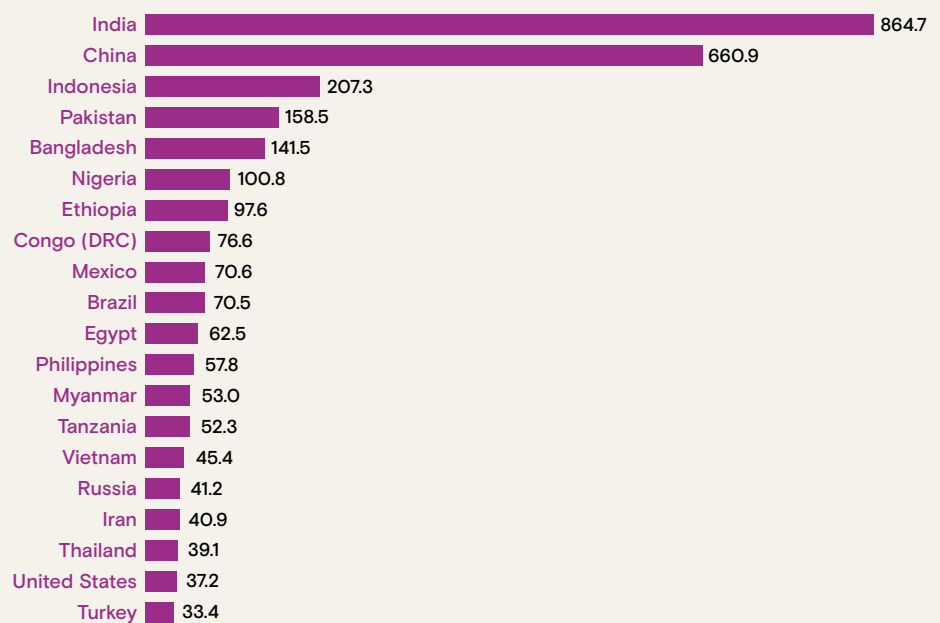- Stian Westlake, executive director, policy and research, Nesta

Introduction:
Capturing inclusion

The Inclusive Internet Index assesses and compares countries according to their enabling environment for the adoption and beneficial use of the internet. Its purpose is to outline the current state of internet inclusion around the world, and to help policymakers and influencers gain a clearer understanding of the factors that contribute to wider and sustainable inclusion.

One particular aim of the Index is to assist in the achievement of the UN's Sustainable Development Goals (SDGs), in particular Goal 5 (gender equality), Goal 9 (industry, innovation and infrastructure, including the goal of universal and affordable internet access by 2020), Goal 10 (reduced inequalities) and Goal 17 (partnerships for the goals).

There is certainly plenty of work to be done. Internet users numbered nearly 3.5bn globally in late 2016, more than triple the figure recorded in 2005. Yet the current total is less than half the world's population: 53%—more than 4bn people—remain unconnected to the internet today.[i] Not surprisingly, this global figure masks vast regional disparities. Just over 20% of Europeans are offline, for example, compared with about 75% of people living in Africa.[ii]

Countries with largest offline population
(millions)

Country	
India	864.7
China	660.9
Indonesia	207.3
Pakistan	158.5
Bangladesh	141.5
Nigeria	100.8
Ethiopia	97.6
Congo (DRC)	76.6
Mexico	70.6
Brazil	70.5
Egypt	62.5
Philippines	57.8
Myanmar	53.0
Tanzania	52.3
Vietnam	45.4
Russia	41.2
Iran	40.9
Thailand	39.1
United States	37.2
Turkey	33.4

Source: : Internet Live Stats

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i   ITU, *Key ICT indicators for developed and developing countries and the world, 2005-2016*.
ii   ITU, *ICT facts and figures 2016*.

Introduction: Capturing inclusion

The unconnected remain so for a variety of reasons. In Europe and North America, people typically remain offline owing to a lack of skills or the belief that the internet does not have much to offer them.[iii] As Stian Westlake, executive director for policy and research at Nesta, a UK-based non-governmental organisation (NGO), explains: "In the rich world, non-use of the internet is mainly a matter of personal choice now. Ten years ago you could find economic or social reasons. Today, it's mostly people deciding that the benefits don't justify it."

In low- and middle-income countries, meanwhile, the cost of access remains a barrier. Many developing nations have met the United Nations' stated goal of ensuring that the cost of entry-level broadband access is less than 5% of average national monthly income. Yet only a handful have reached this target for the bottom 20% of income earners.[iv] In rural areas in both developed and developing countries alike, non-existent or inadequate access infrastructure remains a barrier to wider inclusion.

Old divides, new divides

Seen in this light, it is apparent that while some digital divides may have narrowed in recent years, others remain unchanged or have even widened. Disparities in physical access to the internet between higher- and many lower-income countries have lessened, thanks to the faster deployment of mobile broadband infrastructure and the surge in smartphone ownership in Asia, Latin America and parts of Africa. However, as John Garrity, senior connectivity advisor with the US Agency for International Development (USAID), points out, disparities in intensity—meaning the frequency and extent of internet use—are widening. Intensity tends to be higher in the developed world thanks to better infrastructure and the tendency for people to own multiple devices.

The gender gap in internet connectivity also appears to be widening. In 2016 the internet user penetration rate for women globally was 12% lower than for men, according to the UN's International Telecommunication Union (ITU), up from an 11% gap in 2013. The disparity is largest in developing countries, especially in Africa.[v] According to ONE, an anti-poverty advocacy group, if current trends continue, 71% of female Africans will still be offline in 2020, compared with 48% of men.[vi] Women's lower adoption rates result not just from a shortage of access but from a variety

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iii   In the UK, for example, 18% of people surveyed in 2013 said they had no interest in using the internet—a major reason they remained offline. William H Dutton and Grant Blank, with assistance from Darja Groselj, *Cultures of the Internet: The Internet in Britain*, Oxford Internet Survey 2013 Report.

iv   Alliance for Affordable Internet (A4AI), *Affordability report 2015-2016*.

v   ITU, *ICT facts and figures 2016*.

vi   ONE, *Making the connection: How internet access could help lift women and girls out of poverty*, 2016.

of social, economic, infrastructure and content-related factors, as this report will discuss in detail.

Beyond access

Indeed, it is now widely acknowledged that by itself access to mobile or fixed internet infrastructure, even at affordable costs, is not enough to attract the unconnected. It also does not guarantee that people can use the internet to enrich their lives. A 2016 report from the World Bank indicates that "digital dividends"—socioeconomic benefits resulting from the use of digital technologies—have lagged behind improvements in connectivity, especially in the developing world.[vii]

An inclusive internet is not just accessible and affordable to all. It is also relevant to all, allowing usage that enables positive social and economic outcomes at individual and group level. It follows that improving internet inclusion requires more than simply connecting the unconnected; it is about increasing the chances that the connected will use the internet to good effect. This Index aims to support that effort by bringing the current state of internet inclusion into view.
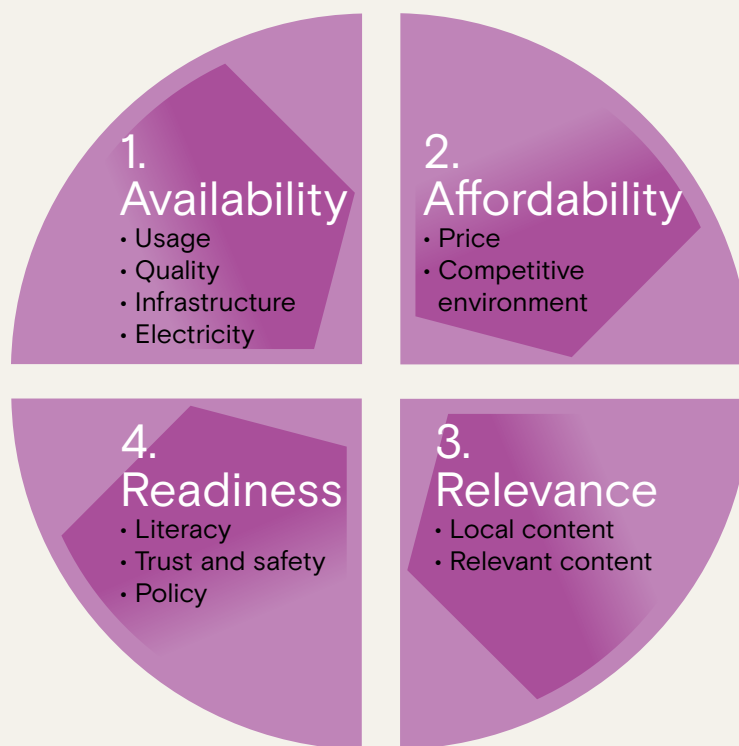
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vii World Bank, *Digital Dividends: World Development Report 2016*.

The Inclusive Internet Index: Overview

The developed countries of Asia, Europe and North America dominate the upper tiers of the Inclusive Internet Index overall and in each of its four pillars—Availability, Affordability, Relevance and Readiness (see chart: Index categories and sub-categories). Clearly, high levels of wealth and economic development enable high-quality digital infrastructure and affordable internet services, relevant internet content and well-developed digital skills and literacy. There are relatively strong statistical relationships in the Index between these indicator categories and gross national income (GNI) per capita. These relationships are stronger when the indicator categories are correlated with The Economist Intelligence Unit's Business Environment Rankings, which assess not only countries' business-friendliness, but also their overall capacity for economic growth and development.

Index categories and sub-categories

1. Availability
   • Usage
   • Quality
   • Infrastructure
   • Electricity

2. Affordability
   • Price
   • Competitive environment

3. Relevance
   • Local content
   • Relevant content

4. Readiness
   • Literacy
   • Trust and safety
   • Policy

However, not all middle-income countries are laggards at inclusion—Romania, Russia and Brazil all rank in the overall top 20. Malaysia is the global leader in the Readiness pillar. Internet users in China, Sri Lanka and Vietnam have an ample supply of local content. The affordability of the internet in Brazil, Chile and Argentina rivals much of Europe and Asia,

and these and other Latin American countries also figure in the top half of the table when it comes to Readiness. South Africa has the strongest environment for inclusion on the African continent, ranking in the top half of the table in three of the four pillars (the exception being Relevance).

The Index results nonetheless underscore the scale of the challenges facing the world's lower-income countries in enabling citizens to benefit from the internet. These challenges extend beyond expanding network coverage and bringing down prices. For example, in Sub-Saharan Africa and elsewhere, reliable electric power provision for networks, homes and devices is far from guaranteed.

Nepal, Tanzania and Senegal are the best-performing low-income countries in enabling internet inclusion. Nepal's standing is largely attributable to its development of national e-inclusion policies, Tanzania's position reflects its efforts in the areas of digital literacy and data privacy, and Senegal benefits from initiatives to expand public WiFi access. Only one low-income country ranks in the top half of the table in an individual category (Uganda, which ranks 27th for Relevance, thanks to a strong showing in local content). In the overall index, none rank higher than Nepal, in 56th place.

Poor connectivity and high prices in relation to local incomes go a long way towards explaining the developing world's disadvantages in boosting inclusion. But another persistent barrier is a dearth, in many countries, of relevant local content. This is partly due to the preponderance of English-language content over that in local languages. Translation and user interface localisation tools can help redress this, but another cause—a shortage of local content producers—is a more deep-seated weakness requiring sustained ecosystem-building efforts to address.

Innovative initiatives are under way in many countries, however, to chip away at these and other barriers to wider inclusion. We will highlight several in the discussion to come.

Inclusive Internet Index Overall ranks

Rank		Score /100	Rank		Score /100	Rank		Score /100
=1	Singapore	90.3	26	Colombia	71.9	51	Kenya	55.2
=1	Sweden	90.3	27	South Africa	71.0	52	Algeria	53.0
3	United States	88.2	28	Saudi Arabia	70.6	53	Pakistan	50.7
4	United Kingdom	88.0	29	China	69.7	54	Myanmar	50.6
5	Japan	87.9	30	Mexico	69.6	55	Cambodia	50.2
6	South Korea	86.9	31	Turkey	68.3	56	Nepal	49.1
7	France	86.6	32	Vietnam	67.9	57	Tanzania	48.5
=8	Canada	85.2	33	Peru	66.3	58	Senegal	46.7
=8	Netherlands	85.2	34	Morocco	65.6	59	Angola	46.3
10	Italy	84.7	35	Indonesia	65.4	60	Côte D'Ivoire	45.9
11	Australia	83.9	36	India	64.4	61	Cameroon	45.6
12	Germany	83.8	37	Egypt	64.3	62	Sudan	45.0
13	Poland	82.7	38	Iran	63.9	63	Rwanda	44.3
14	Spain	81.1	39	Mongolia	63.6	64	Uganda	43.8
15	Russia	80.2	40	El Salvador	63.4	65	Mozambique	43.3
16	Taiwan	79.7	41	Sri Lanka	62.5	66	Yemen	42.0
17	Romania	79.4	42	Venezuela	60.7	67	Burkina Faso	40.2
18	Brazil	78.0	43	Philippines	59.8	68	Zambia	39.4
19	Chile	77.6	44	Maldives	59.7	69	Ethiopia	37.2
20	Argentina	76.2	45	Nigeria	59.4	70	Malawi	32.3
21	Malaysia	75.8	46	Bangladesh	57.8	71	Madagascar	30.7
22	Ukraine	73.8	47	Uzbekistan	56.7	72	Mali	29.7
23	Thailand	72.6	48	Seychelles	56.2	73	Liberia	28.8
24	Oman	72.3	49	Ghana	56.1	74	Niger	26.9
25	Kazakhstan	72.2	50	Guatemala	55.3	75	Congo (DRC)	24.1

Inclusive Internet Index **Regional ranks**

Africa	Rank	Score /100
1	South Africa	71.0
2	Morocco	65.6
3	Egypt	64.3
4	Nigeria	59.4
5	Seychelles	56.2
6	Ghana	56.1
7	Kenya	55.2
8	Algeria	53.0
9	Tanzania	48.5
10	Senegal	46.7
11	Angola	46.3
12	Côte D'Ivoire	45.9
13	Cameroon	45.6
14	Sudan	45.0
15	Rwanda	44.3
16	Uganda	43.8
17	Mozambique	43.3
18	Burkina Faso	40.2
19	Zambia	39.4
20	Ethiopia	37.2
21	Malawi	32.3
22	Madagascar	30.7
23	Mali	29.7
24	Liberia	28.8
25	Niger	26.9
26	Congo (DRC)	24.1

Asia	Rank	Score /100
1	Singapore	90.3
2	Japan	87.9
3	South Korea	86.9
4	Australia	83.9
5	Taiwan	79.7
6	Malaysia	75.8
7	Thailand	72.6
8	Kazakhstan	72.2
9	China	69.7
10	Vietnam	67.9
11	Indonesia	65.4
12	India	64.4
13	Mongolia	63.6
14	Sri Lanka	62.5
15	Philippines	59.8
16	Maldives	59.7
17	Bangladesh	57.8
18	Uzbekistan	56.7
19	Pakistan	50.7
20	Myanmar	50.6
21	Cambodia	50.2
22	Nepal	49.1

Europe	Rank	Score /100
1	Sweden	90.3
2	United Kingdom	88.0
3	France	86.6
4	Netherlands	85.2
5	Italy	84.7
6	Germany	83.8
7	Poland	82.7
8	Spain	81.1
9	Russia	80.2
10	Romania	79.4
11	Ukraine	73.8
12	Turkey	68.3

Americas	Rank	Score /100
1	United States	88.2
2	Canada	85.2
3	Brazil	78.0
4	Chile	77.6
5	Argentina	76.2
6	Colombia	71.9
7	Mexico	69.6
8	Peru	66.3
9	El Salvador	63.4
10	Venezuela	60.7
11	Guatemala	55.3

Middle East	Rank	Score /100
1	Oman	72.3
2	Saudi Arabia	70.6
3	Iran	63.9
4	Yemen	42.0

Chapter 1:
Connectivity is still hard

Physical access to infrastructure may be the most studied aspect of internet connectivity.[8] There is a reason for this: there is no inclusion, indeed no connectivity at all, without infrastructure in close proximity to people. "Basic connectivity at an affordable price is where inclusion starts," says Tim Unwin, UNESCO chair in ICT4D and emeritus professor of geography at Royal Holloway, University of London.

This fact is reflected in the composition of the Index: a country's Availability score has the greater impact on its overall index ranking than

Inclusive Internet Index Availability ranks

Rank		Score /100	Rank		Score /100	Rank		Score /100
1	Singapore	95.8	26	Ukraine	63.8	51	Cambodia	42.5
2	Sweden	88.0	27	Maldives	63.6	52	Nepal	39.8
3	Netherlands	86.5	28	Morocco	63.3	53	Senegal	38.2
4	Japan	83.7	29	Argentina	62.8	54	Pakistan	36.6
5	South Korea	82.6	30	South Africa	62.1	55	Kenya	35.8
6	Australia	81.3	31	China	61.2	56	Nigeria	35.5
7	United Kingdom	81.2	32	Mexico	61.1	=57	Côte D'Ivoire	32.3
8	Germany	78.8	33	Turkey	60.6	=57	Rwanda	32.3
9	Romania	78.4	34	Seychelles	58.6	59	Myanmar	29.8
10	United States	78.1	35	Egypt	58.0	60	Tanzania	26.9
11	France	77.8	36	Iran	57.6	61	Angola	25.8
12	Canada	77.3	37	Mongolia	56.7	62	Sudan	25.5
13	Taiwan	76.7	38	Peru	56.6	63	Cameroon	24.4
14	Italy	76.3	39	El Salvador	55.5	64	Mozambique	24.3
15	Spain	75.8	40	Vietnam	55.3	65	Ethiopia	24.0
16	Poland	75.0	41	Philippines	53.6	66	Uganda	23.3
17	Russia	70.6	=42	Indonesia	52.0	67	Yemen	22.7
18	Oman	69.5	=42	Sri Lanka	52.0	68	Mali	19.3
19	Kazakhstan	69.4	44	Venezuela	51.5	69	Burkina Faso	18.9
20	Thailand	67.6	45	Uzbekistan	51.0	70	Zambia	18.3
21	Brazil	65.8	46	India	47.3	71	Madagascar	17.9
22	Saudi Arabia	65.7	47	Ghana	47.1	72	Niger	16.4
23	Malaysia	65.0	48	Guatemala	46.1	=73	Liberia	12.7
24	Colombia	64.1	49	Algeria	46.0	=73	Malawi	12.7
25	Chile	64.0	50	Bangladesh	43.4	75	Congo (DRC)	5.2

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8   Examples include the World Economic Forum's Networked Readiness Index (published yearly since 2001); the ITU's annual ICT Development Index (since 2009); The Web Index from the World Wide Web Foundation (since 2012); and the GSM Association's Mobile Connectivity Index (launched in 2016).

the other categories. It is unsurprising, then, that the ten highest-ranked countries for Availability overlap with the overall Index top ten.

Nevertheless, the Index illustrates some considerable gaps in Availability and Affordability between developed and developing countries. When it comes to Availability, this is especially noticeable in fixed broadband adoption, where no low- or lower-middle-income country ranks higher than Ukraine's 26th (with 6.9 subscriptions per 100 inhabitants).

Many developing countries without extensive fixed-line infrastructure have sought to compensate by deploying mobile networks widely, and some have succeeded. According to the ITU, there were 43 mobile broadband internet subscriptions (3G or above) for every 100 inhabitants in the Asia-Pacific region in 2016.[9] Elsewhere, the reverse is happening: India, for example, is building more broadband and WiFi capability to take the strain off mobile networks. In Africa, meanwhile, although mobile subscriber growth has been rapid, mobile broadband access is limited: the countries in which more than 60% of the population is covered by 3G networks—required for accessing most types of internet content—account for less than half of the African countries covered in the Index.

Out of reach for many

Despite these efforts, internet access remains unaffordable for many in the developing world. "In several developing countries, internet access is still not affordable for most income groups by UN standards," observes Dhanaraj Thakur, research manager at the Alliance for Affordable Internet (A4AI). According to his organisation's research, the average cost of an entry-level 500MB prepaid plan was 15% of per-capita income in less-developed countries and over 6% across developing countries overall.[10] (The UN's threshold of affordability is 5% of average monthly income. A4AI is pushing to reduce this to 2% to account for extreme poverty among the lowest 20% of income earners.)

Generally speaking, the more robust the competition in internet service provision, the lower the access prices and the higher the level of adoption. According to the ITU, broadband penetration in competitive markets is 1.4% higher for fixed-line connections and up to 26.5% higher for mobile broadband,[11] indicating a link between competition and adoption.

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9   ITU, *ICT Facts and Figures 2016*.

10   Alliance for Affordable Internet (A4AI), *Affordability report 2015-2016*.

11   ITU and Cisco, *Planning for Progress: Why National Broadband Plans Matter*, 2013.

Inclusive Internet Index **Affordability ranks**

Rank		Score /100	Rank		Score /100	Rank		Score /100
1	Canada	99.3	26	India	81.0	51	Tanzania	67.9
2	United States	98.8	27	Malaysia	80.6	52	Kenya	67.2
3	France	96.8	28	Taiwan	80.0	53	Seychelles	66.8
4	Sweden	96.7	29	Thailand	79.1	54	Maldives	66.6
5	United Kingdom	96.2	30	Bangladesh	78.4	55	Cambodia	66.4
6	Italy	94.7	31	El Salvador	76.9	56	Angola	66.0
7	Poland	93.8	32	Vietnam	76.5	57	Iran	64.8
8	Russia	93.5	33	Saudi Arabia	74.4	58	Philippines	64.1
9	Brazil	92.3	34	Pakistan	74.3	59	Côte D'Ivoire	63.8
10	Japan	91.2	35	Mexico	73.5	60	Yemen	63.7
11	South Korea	90.7	36	Kazakhstan	73.3	=61	Uzbekistan	63.5
12	Nigeria	90.2	37	Turkey	73.2	=61	Zambia	63.5
13	Singapore	89.3	38	China	73.0	63	Rwanda	61.3
14	Germany	89.1	39	Cameroon	72.8	64	Mozambique	59.5
15	Chile	87.5	40	Algeria	72.4	65	Senegal	57.7
16	Argentina	86.7	41	Peru	72.3	66	Burkina Faso	55.5
17	Romania	86.4	42	Venezuela	72.1	67	Nepal	53.0
18	South Africa	85.8	43	Sri Lanka	71.6	68	Uganda	49.2
19	Colombia	85.7	44	Myanmar	71.4	69	Mali	48.0
20	Mongolia	85.3	45	Egypt	70.7	70	Ethiopia	46.9
21	Australia	84.7	46	Morocco	70.1	71	Madagascar	42.6
22	Netherlands	84.3	47	Guatemala	69.4	72	Liberia	41.1
23	Ukraine	84.2	48	Sudan	68.6	73	Malawi	39.7
24	Indonesia	84.1	=49	Ghana	68.0	74	Niger	35.9
25	Spain	82.3	=49	Oman	68.0	75	Congo (DRC)	22.7

Mr Garrity of USAID, however, argues that while vibrant competition can lead to lower prices and more investment, it does not eliminate the need for robust consumer protection safeguards. "Increased competition, more often than not, leads to lower access prices for consumers. But competition by itself does not prevent operators from taking advantage of consumers with behaviour such as unsavoury marketing tactics and unfulfilled quality-of-service obligations." He cites the example of Brazil, where the regulator has criticised providers for failing to meet their quality-of-service obligations.

When considering the number of wireless and fixed broadband providers in each country, the Index finds that developed markets tend to exhibit

WiFi bridges to wider inclusion

Where mobile or fixed internet connections remain unaffordable, public-access WiFi can help people get online without emptying their wallets. Citizens of developed countries, particularly urban denizens, are by now accustomed to WiFi coverage at low or no cost in cafes, universities, libraries, public transport and even in streets and public squares. The largest internet service provider in all but three of the 19 high-income countries included in the Index offers free public WiFi.

Singapore is arguably a standard-bearer of public-access WiFi, having launched the Wireless@SG programme in 2006 to provide free access in public areas. Since then it has reportedly created 10,000 hotspots across the island. The government aims to double this figure by 2018 and to increase available speeds from the current 2 Mbps to 5 Mbps.

Several countries in the developing world are advancing with similar programmes. In South Africa, for example, Project Isizwe, a not-for-profit enterprise launched by a local technology entrepreneur, has helped the City of Tshwane Metropolitan Municipality (which includes the capital, Pretoria) to launch 803 "free WiFi zones" since 2013. The project is now working with the municipalities of Cape Town and Johannesburg to do the same.

Elsewhere in southern Africa, Botswana's government is facilitating the rollout of free WiFi hotspots in rural villages as well as urban centres. Botswana's initiative is noteworthy, says Dhanaraj Thakur, research manager at the Alliance for Affordable Internet (A4AI), partly because it is a public-private partnership. "The government uses the Universal Service Fund[12] to partner with private operators and provide public WiFi at a subsidised rate to consumers. This example offers a potentially effective way of applying universal funds to support public access in the developing world."

less market concentration than developing country markets, as well as higher adoption levels and greater affordability. Notable exceptions among developing countries include India, Nigeria and Mongolia, which have relatively high numbers of wireless and/or fixed broadband providers.

Quality beyond the last mile

Although last-mile access—the final network link to the user—is important, internet quality depends on much more than this. Mr Thakur points out, for example, that mobile broadband development is often hindered in developing countries owing to insufficient attention given to backhaul—the fixed and wireless infrastructure that moves traffic between the cell sites in a region and connects them to the backbone network. Inadequate backhaul can lead to more expensive broadband and slow transmission speeds.

Local internet exchange points (IXPs) can also do much to boost fixed and mobile access speeds and reduce prices. IXPs are also likely to contribute to greater local content generation and consumption. This indicator is included in the Availability pillar of the Index (see "IXPs bring the internet closer to home").

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12 A universal service fund (USF) is a set of subsidies and fees used by governments as a financial incentive to domestic telecoms operators to provide communications services to the widest number of citizens at affordable prices.

Electric power, another critical element of infrastructure, often fails to be considered in national broadband development plans. Unreliable electricity provision is a particular hindrance to internet use in less developed African, Asian and Caribbean countries.[13] The Index results indicate that reliable electricity provision is anything but guaranteed in many developing countries, particularly in Sub-Saharan Africa and parts of Asia. In Myanmar, for example, less than one-third of the population has access to electric power.

Juliana Rotich, co-founder of BRCK, a Nairobi-based technology start-up, notes that a few African governments are now paying attention to electricity supply in the context of inclusion. She gives credit to the Kenyan government, for example, for connecting most of the country's schools to the national grid as part of its digital literacy programme.

In East Africa, the electricity challenges are breeding some innovative approaches, such as the portable device marketed by BRCK, which combines mobile, WiFi and Ethernet connectivity with up to eight hours of battery storage to power the device when the electricity supply is interrupted. Other approaches combine the realms of energy, telecommunications and finance. M-KOPA, a Kenyan start-up, and Mobisol, a German company, provide solar-powered appliances and devices to lower-income Kenyan consumers who have little reliable access to grid electricity. Consumers pay for their solar power using the country's well-established mobile payment systems.

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13 See, for example, Laura Hosman and Laura Elizabeth Armey, *The Centrality of Electricity for Internet Uptake in Low-Income Countries*, 2014.

IXPs bring the Internet closer to home

Internet exchange points (IXPs—physical locations where internet traffic between different networks is exchanged) are a critical element of local internet infrastructure. They are ubiquitous in developed countries but thin on the ground in many developing ones. Building more of them ensures, in theory, that more internet traffic consumed locally is routed through in-country networks rather than from international connections. Their ultimate promise is of lower traffic costs borne by consumers and, potentially, the expanded development of local content. Some lower-middle- and low-income countries—including Cambodia, Rwanda, Angola, Côte d'Ivoire and Kenya—are making efforts to build such capacity, as demonstrated in the Index. But it is no coincidence that lower-middle- and low-income countries dominate the lower half of the Index in the prevalence of IXPs, the price indicators of the Affordability pillar and the availability of local content.

Michael Kende, a senior adviser with Analysys Mason, a consultancy, has studied (under the auspices of the Internet Society) the impact of building IXPs in East Africa[14] and found that they have helped to reduce the cost of content delivery as well as improve its speed. "That may not immediately lead to lower prices for consumers, but it should once a critical mass of content is hosted locally," he says.

John Garrity, senior connectivity adviser at USAID, agrees that IXPs can also improve access quality. "The argument for developing IXPs is that not only does the cost of service decrease for consumers, but the quality of experience also increases," he says. "More IXPs also mean more content can be hosted locally, and that can improve quality of service."

Steven Huter, director of the Network Startup Resource Centre at the University of Oregon, explains how IXPs can generate such benefits: "A major motivation of creating IXPs is to bring together a set of local access providers in a country to allow them to directly peer with each other, without having to pay transit providers to perform the cross-connect. As long as there is a sizeable volume of local traffic exchanged, IXPs serve to keep an important percentage of the local traffic off the expensive international links."

According to Mr Huter, an IXP can help to make access to content more affordable and improve response time once content providers and content hosts realise that there is an advantage to hosting their content locally and that there are available facilities. Establishing an IXP is an important step, but it is not sufficient to catalyse local content growth, he adds. "Co-operation between local operators, ISPs and content providers, as well as a supportive regulatory environment, are also required for an IXP to have a meaningful impact on internet inclusion."

Prevalence of IXPs, selected countries
(IXPs per 10m inhabitants)
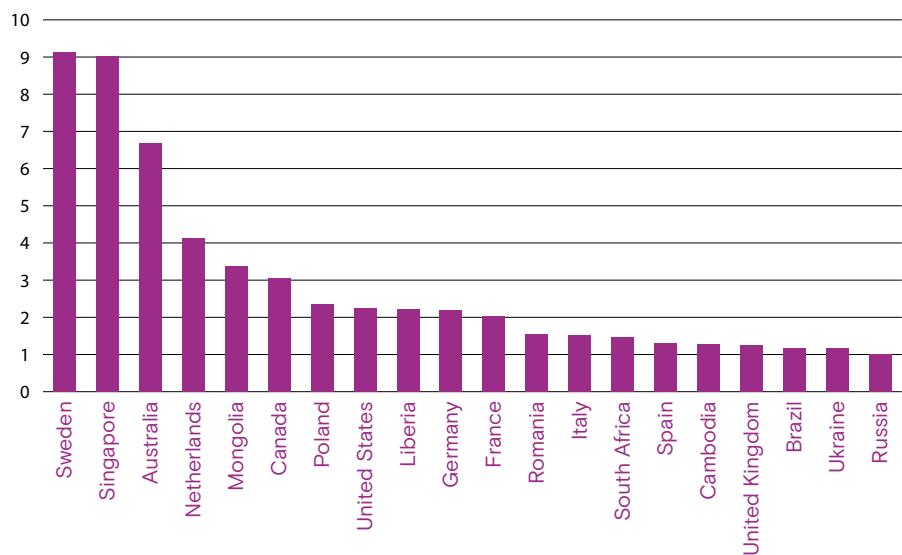
Sources: Economist Intelligence Unit; Telegeography

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14 Michael Kende and Karen Rose, *Promoting Local Content Hosting to Develop the Internet Ecosystem*, January 2015; Michael Kende and Charles Hurpy, *Assessment of the impact of Internet Exchange Points: empirical study of Kenya and Nigeria*, April 2012.

Internet.org perspective of Availability and Affordability

Countries are making the transition to becoming digital societies. In the 75 countries included in the Inclusive Internet Index, on average 94% of the population lives within range of a mobile signal. This is reason for optimism.

However, access is not the same as inclusion. While 94% of the world can access a 2G network, just over 43% have access to a 4G signal. 3G wireless technology is the minimum standard enabling someone to have a mobile internet experience. In practice, it is impossible to experience the internet on a 2G connection. Thus, the majority of the connected world remains under-connected. People would use the internet more and for a wider range of tasks if it was cheaper, faster and more relevant. The infrastructure for access may exist, but connectivity is far from globally inclusive.

Avgerage % population with connection

	2G	3G	4G
All countries	94%	76%	43%
High income	99%	98%	88%
Upper middle income	97%	82%	49%
Lower middle income	93%	67%	25%
Low income	84%	52%	8%

The under-connected live disproportionately in developing countries. In low-income countries, an average of just 8% of the population can access a 4G signal. In contrast, in the average high-income country, 88% of people have access to 4G.

To be sure, 2G may be a gateway to the internet for the unconnected and under-connected. Twenty-five years ago people were first exposed to the internet through dial-up connections, an apt analogy to 2G. But those early adopters quickly migrated to faster and more robust connections, including DSL and cable modems. Unless people have the opportunity to migrate from 2G to 3G to 4G and beyond, they remain under-connected.

Inclusive internet in the 21st century means that people have access to a high-quality and affordable connection, which is still lacking in most of the world—and particularly in the developing world, where it can perhaps have the greatest impact on economic, social and political progress.

Internet.org perspective of Availability and Affordability

Two actions are needed to move towards a fully inclusive internet:

- **Access for the unconnected**: We need to make sure that the remaining 6% of the world have access to at least 2G, so that they too can access the internet. This requires solving difficult technical challenges to bring infrastructure to some of the most remote corners of the world. For example, we need to build last-mile links, whether 2G, 3G, 4G, Wi-Fi or satellite ground stations, providing backhaul and middle-mile infrastructure and/or providing power where none exists.[i]

- **Quality connection for the under-connected**: Everyone should have the opportunity to migrate to a higher-quality connection at an affordable price. This means bringing high-capacity bandwidth to existing local access endpoints where it does not exist today. It may also require that end users upgrade their equipment and devices.

i   One of the biggest constraints on networks being able to upgrade from 2G to 3G or 4G is the lack of sufficient backhaul capacity in exurban and rural areas, which are usually underserved and rely on 2G connections.

Chapter 2:
No relevance, no outcomes

Affordable access to the internet does not guarantee its use. People's willingness to use the internet relies on their belief that the content and services available on it are relevant to their lives. If there is no relevant content—both in terms of its applicability to their lives and the language and format in which it is presented—internet adoption will most likely be limited.

"Even where people can afford it, if there's not much content locally that's relevant to them, they are not going to go online," says Michael Kende, a senior adviser with Analysys Mason, a consultancy. There are parts of Africa, he adds, where there is affordable access but little content available in the local language, making the internet experience less than compelling for people.

Inclusive Internet Index Relevance ranks

Rank		Score /100	Rank		Score /100	Rank		Score /100
1	United States	90.6	26	China	77.5	51	Guatemala	57.1
2	Japan	89.1	=27	Peru	72.6	52	Nepal	56.3
3	United Kingdom	88.8	=27	Uganda	72.6	53	Yemen	55.6
4	South Korea	88.5	29	Saudi Arabia	72.1	54	Cameroon	54.8
5	Canada	88.3	30	Sri Lanka	71.5	55	Maldives	54.5
6	Australia	88.2	31	Kenya	69.2	56	Ghana	54.4
7	France	87.8	32	Romania	68.9	57	Bangladesh	54.3
8	Sweden	86.9	33	Kazakhstan	68.7	58	Senegal	53.7
9	Germany	85.7	34	Thailand	68.3	=59	Mozambique	53.4
10	Spain	85.4	35	El Salvador	67.0	=59	Uzbekistan	53.4
11	Italy	85.3	36	India	66.8	=61	Burkina Faso	53.1
12	Russia	84.9	37	Iran	66.4	=61	Mongolia	53.1
13	Brazil	84.3	38	Egypt	65.6	63	Ethiopia	52.6
14	Netherlands	84.2	=39	Morocco	64.6	64	Côte D'Ivoire	49.9
15	Chile	83.6	=39	Myanmar	64.6	65	Pakistan	47.2
16	Singapore	83.3	41	Philippines	64.4	66	Sudan	47.1
17	Turkey	83.0	42	Malawi	61.9	67	Liberia	45.7
18	Vietnam	82.9	43	South Africa	61.4	68	Algeria	44.6
=19	Malaysia	82.0	44	Colombia	61.1	69	Zambia	43.9
=19	Poland	82.0	45	Venezuela	60.7	70	Madagascar	41.6
21	Argentina	81.9	46	Congo (DRC)	60.5	71	Cambodia	40.7
=22	Taiwan	81.4	47	Indonesia	60.3	72	Seychelles	40.5
=22	Ukraine	81.4	48	Nigeria	59.2	73	Niger	39.0
24	Mexico	78.2	49	Angola	58.8	74	Rwanda	38.7
25	Oman	77.6	50	Tanzania	58.3	75	Mali	25.8

Dawit Bekele, director of the Africa regional bureau of the Internet Society, an American non-profit organisation, agrees: "For those who are still unconnected, they need to have local content to consume that is in their own language. If they find that, they might become interested. Most are not interested in reading or watching foreign media."

The existence of relevant content and useful applications such as internet-based communications apps, however, may convince low-income people for whom cost of access is a barrier to get online. James Manyika, director of the McKinsey Global Institute, says his firm's research has found this to be the case in some rural communities in Africa that are part of a wider diaspora, whether within the country or internationally.

Relevance is another aspect of inclusion in which the developed world enjoys enormous advantages over less developed regions. Companies and other organisations that produce digital content are more likely to flourish, after all, where business environments are stronger and sources of finance more plentiful. A handful of middle-income countries, however, achieve relatively favourable ranks in this area, including Russia, Brazil, Vietnam and Malaysia, thanks to strong ecosystems of local and relevant internet content.

Creating magnets

Relevant content takes many forms. It may be news, weather and other informational websites and apps. It may be educational content, delivered in text, video or audio formats. The Index includes indicators assessing the local online availability of banking services, of health-related services and information, of e-commerce services, and of video entertainment (see "Why entertainment matters"). It also considers citizens' ability to access public services online.

William Dutton, professor of media and information policy at Michigan State University, explains that the local availability of these and other types of content can drive people online. "There's no single trigger service or form of content that will achieve this; it can be one of many."

Spurring local content development, however, is a multi-faceted challenge. According to Mr Garrity, it requires the creation of an ecosystem where different actors—including content creators, app developers, service providers, entrepreneurs, venture-capital firms and banks as well as policymakers and administrators—work in tandem. In Africa, observes Ms Rotich, such ecosystems are a rarity. Speaking of digital music, for example, she says: "A music industry of sorts exists in Tanzania and

Why entertainment matters

Video games, films and music tracks may not be everyone's idea of useful digital content. But such forms of entertainment can be instrumental in furthering internet inclusion.[15] An Xiao Mina, a research fellow at Harvard University's Berkman Klein Center for Internet & Society, argues that in some parts of the world games and videos motivate people to go online, the young particularly. This is amply demonstrated, she says, in Asia: "Gaming and other forms of entertainment—including movies, music and humour—are instrumental in getting young people in this region to use the internet. They are also an important way to develop skills around digital literacy."

According to research by trade body GSMA, published in 2015, entertainment (which includes music and games) is the primary type of internet service accessed by Asian smartphone users. It outstrips communication, search, news and information, and other forms of content. (Video is listed separately and ranks after news and information.)[16]

In the Inclusive Internet Index, Japan and South Korea are among the stronger performers in the Relevance pillar (ranking 2nd and 4th respectively). South Korea's performance derives partly from the widespread availability of digital entertainment. This indicator hones in

on visits to video-streaming sites. When it comes to digital games, including video games, South Korea's market is the world's fourth-largest, after those of China, the US and Japan—countries with far larger populations.[17]

South Korea has long been considered the world's pacesetter in online gaming platforms. Its "PC bangs" (PC game rooms) are a magnet for young people looking to engage in various types of multi-player video games, and more generally to socialise with friends. For young South Koreans, online games are instrumental in popularising internet use. That said, there are also concerns about the addictive effects such games can have on young people.[18]

Nigeria, but elsewhere the link between content creation, its distribution and the creator's remuneration is tenuous."

E-government services are often a highly useful form of local content. "Where governments put their own services and related information online, internet adoption is usually accelerated, sometimes dramatically," says Mr Manyika. This has been the case in the developed world, but he also praises developing-country governments, including India's, for stimulating demand for internet access by placing some government services online.

In the Index, the highest e-government score is assigned to countries with websites which enable citizens to conduct transactions online, such as applying for driving licences or obtaining business permits. Not all developing countries meet this criterion, but most provide at least public-service information and allow useful forms to be downloaded. In the

15 See, for example, James Stewart and Gianluca Misuraca, *The industry and policy context for DGEI: market analysis, future prospects and key challenges in videogames, serious games and gamification*, 2013.

16 GSMA, *Mobile internet usage challenges in Asia — awareness, literacy and local content*, July 2015.

17 "Digital games market reaches $83.2bn in 2016; China takes more than one quarter", *Newzoo*, July 28 2016; SuperData and Worldpay, *Digital games spending in Asia*, 2015.

18 "Online gaming: An integral part of the South-Korean culture", *Video games*, June 20 2013.

context of inclusion, this may be considered a minimum to ensure that people actually use the websites. If such content is difficult to access or not useful, people are unlikely to return.

The same is true for attempts to use the internet to drive greater public participation in government and democracy. "When citizens become disillusioned with the results of online e-participation initiatives—particularly when there is no follow-through on the results—they stop participating in them," says Elisa Lironi, digital democracy manager at the European Citizen Action Service, an NGO.

The right language

The most useful local content will most often be in the primary (or at least secondary) local language. Yet the majority of Internet content produced globally is in English—52%, according to one source[19]—whereas about 25% of the world's population speaks English, and closer to 5% speaks it as their primary language.[20] For An Xiao Mina, a research fellow at Harvard

Conquering linguistic complexity

"How do you provide local language content in a country that has 40 or more languages?" asks Tim Unwin from Royal Holloway, University of London. Doreen Bogdan-Martin, chief of strategic planning at the International Telecommunication Union (ITU), notes that the challenge of local language content is more complex than many people realise. The biggest challenges, she says, are experienced by countries or regions with a high diversity of languages.

Dawit Bekele, director of the Internet Society's Africa regional bureau, believes the challenge is surmountable even in a country such as his native Ethiopia, where more than 80 languages are spoken. "You can publish some things in every language," he says. "The internet is the easiest publishing tool that ever existed."

India has 122 major languages (and 1,599 other languages). Rendering content into all of them may be unrealistic, but regional-language social networking and content publishing apps are gaining in popularity and are attracting increasing investor interest.[21] An example from the state of Kerala is ShareChat, a social networking app which, similar to Tumblr or Instagram (both developed in the US), provides an open platform on which users can create and share different types of content, such as videos, jokes, memes or photos. The difference is that it enables users to create content

not just in Hindi but also in Marathi, Malayalam, Telugu, Punjabi, Oriya, Tamil and Bengali. It plans to expand the list to include additional languages in the near future. Its backers believe that about 250m Indians will come online in the next three years to create content in regional languages using such apps.

The BBC also sees opportunities in the growth of content in India's other major languages besides Hindi, having announced in November 2016 the launch of four new regional websites—in Gujarati, Telugu, Marathi and Punjabi. Elsewhere, it plans to broadcast in Igbo, Pidgin and Yoruba in Nigeria and in Amharic, Oromo and Tigrinya in Ethiopia and Eritrea.

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19 W3Techs, "Usage of content languages for websites".

20 British Council estimates cited in Christopher Burns and Jonathan Dolan, "Building a Foundation for Digital Inclusion", *Digital Inclusion: The Vital Role of Local Content*, MIT Press, 2014.

21 Shashwati Shankar, "Regional language apps all the rage, to have 250 million users in next 3 years", *The Economic Times*, December 5, 2016.

University's Berkman Klein Center for Internet & Society, this is a serious concern: "The internet was created in the US, and as a result its structure leans towards the English language and the Latin alphabet. But people coming online in the next wave are by and large not English-speakers. We need to think about different ways to structure the internet so that content is available in the new wave's languages." She is buoyed, however, by recent advances in web content in Spanish, Arabic and other non-English languages.

Advances such as these may help to explain why only one native English-speaking country (the US) ranks in the top ten in the local content category. Several non-English-speaking countries—in both the developed and the developing world—are tied for 1st in this category, including China, Poland, Ukraine, Sri Lanka, Brazil, Russia and Vietnam. This is partly due to the local prevalence of websites using country-level domains, but also to the availability of e-government and other information in the local language.

Ms Mina also highlights the importance of input systems, such as digital keyboards and fonts, which allow people to create their own language content. She praises Thailand's success in localising user interfaces on websites and devices to accommodate Thai characters, as well as initiatives in India to design apps and websites that can be understood by the country's numerous linguistic groups (see "Conquering linguistic complexity").

Internet.org comment on relevance

The value of the internet lies in the content it provides. Are people aware that the internet will improve their lives and those of their children? Can they find salient information in their local languages? If the answer to these questions is "no", then the internet cannot be inclusive.

Relevance is multidimensional. Each person assesses the value of the internet according to different criteria: one size does not fit all. But for people to connect to each other and to the content that matters to them, they must be aware of it and able to consume it in a language they understand. Local language content is necessary to create universal relevance and is therefore vital to inclusive connectivity. It includes:

- Availability of basic information in the local language(s).
- Availability of local languages on keyboard devices, with support for fonts, scripts and character sets.
- Availability of e-government services in local language(s).

The good news is that lots of countries and communities are working hard to make content available in local languages around the world: 68 out of 75 countries (90.7%) in the Index have basic information, in the form of domestic news websites, available in all official local languages in the largest city.[i]

Countries with content available in local languages

	Availability of basic information in the local language			Availability of e-government services in local language		
	No websites in official language(s)	Websites in some official language(s)	Websites in all official language(s)	The government in the largest city does not have a website	The government in the largest city has a website but it does not allow for conducting transactional services online	The government in the largest city has a website but it allows for conducting transactional services online
All countries	0	6	68	4	34	37
High Income	0	1	18	0	1	18
Upper middle income	0	3	15	0	10	8
Lower middle income	0	1	23	1	14	9
Low income	1	1	12	3	9	2

i   An official language is defined as one that is either included in the constitution of the country or has been designated as such by the government.

Internet.org comment on relevance

However, this does not necessarily imply that all relevant content is available locally. For instance, only 37 out of 75 countries (49.3%) in the Index have a government website that allows users to conduct transactional services online—perhaps one of the most valuable services the internet can provide, especially in developing countries. In fact, low-income and lower-middle-income countries fall behind in terms of public-sector use of the internet.

Access to e-government services in local languages is a strong correlate of the Inclusive Internet Index. Indeed, 78% of the countries that offer e-government services score above the median of the Index. This makes sense: e-government services not only increase trust and transparency but also provide transactional benefits to citizens, for example, by making it easier to file for permits or pay bills. Many unserved and underserved places are either agricultural or rely on fishing, and providing weather information, perhaps as an e-government service, is a critical type of content that can lead to daily usage of the internet and significantly impact a family or community's livelihood.

When citizens are able to connect to their representatives online, find vital information and perform necessary task, the internet quickly becomes not just a relevant part of everyday life, but a necessity. A positive example is India, where adoption of a digital ID system in local languages has spurred overall internet adoption. Likewise, the Agence De l'Informatique de l'Etat (ADIE) in Senegal provides an extensive set of services and information for both government agencies and individual citizens.

As next steps, governments, companies and organisations should:

- **Focus on scaling translation**: Inevitably, there will be less content available online in minority languages than in major languages. Companies such as Google and Facebook are building tools to crowdsource translations, so that language is not a barrier to platform access. Moreover, new technologies—such as advances in machine learning—mean that content can be quickly and automatically translated into multiple languages.

- **Foster and create incentives for local content production**: Governments should promote policies and projects that add services online. One effective way to create local content is to develop public-private partnerships that include governments, the private sector and non-governmental organisations (NGOs).

Chapter 3:
The capacity to capitalise

The capacity of individuals to use the internet is another important enabler of inclusion. Defined here as Readiness, it forms the fourth category of our Index. It encompasses people's skills to use internet content and services and their ability to do so safely. It also addresses the degree of access that women have to the internet. (Policy development, which is discussed later, also affects Readiness scores in this category.)

As elsewhere in the Index, high-income countries dominate the upper tier of the Readiness table, yet more confirmation of the advantages that wealth and economic development confer in internet inclusion. However, several less developed countries in the upper-middle income category also score highly, led by Malaysia, the global leader in the Readiness ranks. Argentina, Kazakhstan, Romania and Colombia also figure in this pillar's top 20. Their

Inclusive Internet Index Readiness ranks

Rank		Score /100	Rank		Score /100	Rank		Score /100
1	Malaysia	92.3	26	China	78.1	51	Uganda	51.7
2	United States	92.2	27	Saudi Arabia	75.4	52	Cambodia	51.4
3	Japan	92.0	28	Mexico	74.7	53	Mozambique	50.0
4	Chile	90.6	29	Peru	74.4	54	Sudan	48.1
5	Spain	89.8	30	Indonesia	73.5	55	Mongolia	47.9
6	South Korea	89.7	31	Brazil	70.9	56	El Salvador	47.4
7	United Kingdom	89.3	32	Kenya	69.1	57	Seychelles	46.3
8	France	88.9	33	Russia	69.0	58	Guatemala	45.7
=9	Kazakhstan	87.7	34	Canada	68.5	59	Angola	44.5
=9	Taiwan	87.7	35	Ukraine	67.7	60	Pakistan	43.7
11	Argentina	87.1	36	Egypt	67.5	61	Myanmar	43.3
12	Italy	87.0	37	Uzbekistan	66.0	62	Zambia	41.9
13	Sweden	86.7	38	Morocco	63.4	63	Algeria	39.4
14	Oman	86.1	39	Nigeria	62.9	64	Côte D'Ivoire	38.1
15	Singapore	85.0	=40	Philippines	62.7	=65	Maldives	34.1
16	Netherlands	84.6	=40	Venezuela	62.7	=65	Senegal	34.1
17	Germany	83.8	42	Vietnam	62.6	67	Cameroon	30.6
18	Romania	83.4	43	Bangladesh	60.3	68	Congo (DRC)	30.5
19	Australia	83.2	44	Nepal	60.1	69	Ethiopia	30.2
20	Colombia	83.0	45	Ghana	59.7	70	Malawi	29.4
=21	Iran	81.6	46	Sri Lanka	59.5	71	Yemen	27.0
=21	Poland	81.6	47	Tanzania	56.7	72	Madagascar	25.1
=21	South Africa	81.6	48	Turkey	54.7	73	Mali	24.5
24	Thailand	81.1	49	Burkina Faso	53.3	74	Liberia	22.2
25	India	78.3	50	Rwanda	52.7	75	Niger	17.8

development of digital policies, which address broadband development and e-inclusion, partly explain this strong performance. Most of these countries also receive good marks for efforts to expand digital literacy and education, and to build people's trust in using the internet.

Awareness and understanding

Readiness starts with an awareness of what the internet has to offer. In Pakistan's rural areas, according to Maria Umar, founder and president of the Women's Digital League, "people don't understand that they can use the internet to find out, for example, what kinds of pesticides they can use on their crops, and where to buy them from. Women don't realise that they can use the internet to sell whatever small products they have, such as embroidery, for thousands of dollars rather than the fraction of it that they often get."

Even in high-income countries such as the US, not everyone is aware of the internet's potential benefits. "A dominant reason Americans value the internet is its efficiency, its ability to get things done easier and faster," observes Professor Dutton. "But those not online doubt that efficiency. Building awareness requires doing a better job informing people that they can save time and money by being online. Many people just don't buy into it."

There are many reasons why people may not accept the internet, and each one is a challenge to inclusion. In many European countries the elderly, for example, are reluctant to use the internet due to a lack of confidence in its benefits or their ability to master it.[22] In some low-income countries, especially in rural areas, limited acceptance of the internet among women and girls helps to explain the growing disparities in internet adoption between the sexes, and the disadvantages that women often face in using it. Fostering greater internet use by women poses a complex set of challenges, according to Nilanjan Raghunath, assistant professor at the Singapore University of Technology and Design. "Some are technology-specific, but others have to do with education, literacy, economics and culture."

In Africa, says Eunice Musiime, executive director of Akina Mama wa Afrika, a pan-African women's rights NGO, the difficulties women face in accessing and using the internet are manifold, beginning with poverty. "Women remain the poorest of the poor, so there is unequal access in that sense. Inequality in education is also a hindrance: girls' drop-out rates are

22 See, for example, Alexander van Deursen and Ellen Helsper, "A nuanced understanding of Internet use and non-use amongst older adults", *LSE Research Online*, April 2015.

Promoting internet awareness and safe digital practices among women

"Given everything we know today about the importance of women's access to digital technology, the widening gender divide in internet access is rather disheartening," laments Doreen Bogdan-Martin, the chief of strategic planning at the International Telecommunication Union (ITU).

Her organisation and several others are working hard to reduce this gap. As valuable as the financial, technical and other resources are that international groups can mobilise to meet this challenge, the efforts of small non-governmental organisations (NGOs) working in-country are just as important.

In Pakistan, the Women's Digital League (WDL), founded in 2009 by Maria Umar, conducts four-week training courses for women in several provinces of Khyber Pakhtunkhwa, a region with a highly patriarchal culture and one that is rife with extremism. Funded by the World Bank, the programme aims "to find educated women, whether students, housewives or working women, and educate them

in what they can do online, where they can sell their skills or even their products," Ms Umar says. After training in basic skills, the women are shown how to use specific applications such as Photoshop, Word Press and social media. The course was first run in 2015, and Ms Umar reports that several of its graduates have since been able to start earning income from work they've found through the internet.

Safety first

Just as important in engendering trust is showing women how to use the internet safely. "The internet, while it has created immense opportunities, has also further created insecurity for women to be in these spaces, partly due to negative cultural norms," says Eunice Musiime, executive director of Akina Mama wa Afrika (AMwA), an NGO which advocates policies and practices to make the internet safe for women. In some rural communities, for example, a woman posting her picture on Facebook will elicit a negative reaction in her village. "Older men and women in the village will ask why she is even

posting her picture," she says.

Popular education is the best way to foster safer internet use by African women, Ms Musiime believes, and AMwA promotes discussion and debate on how to achieve this. Topics include dealing with online harassment and safeguarding privacy. Advice is offered to women, for example, on how to block men who are trying to communicate with them. Women are also trained in how to use encryption and others apps which protect their identity and which summon help if they are in danger.

Train the men, too

As useful as such grass-roots programmes are, some experts believe that training for women by women omits what should be a key target: men. One such expert is Tim Unwin of the University of London's Royal Holloway. "You're not going to change things unless you change men's attitudes, because the power of patriarchy is the key issue," he maintains. "There needs to be a shift of focus of gender-based digital initiatives."

still high across the continent. Then there is the double burden that women face, having to work and look after children, allowing them little free time for anything else, including social media." These barriers are particularly high in rural areas, where many women use analogue phones that cannot easily access the internet (see "Promoting internet awareness and safe digital practices among women"). Ms Musiime praises Kenya and Rwanda, as well as the countries of southern Africa, for engaging in national and local discussion about the digital barriers women face.

In the Index, Taiwan, Spain, the UK and Singapore take the lead for enabling internet access for women. There is a yawning gap between the developed and developing worlds where female inclusion is concerned:

Chapter 3: The capacity to capitalise

virtually the entire bottom half of the table for female internet access is populated by lower-middle- and low-income countries. In many of these, women's access to mobile phones closes the gap to some extent, although the 3G coverage needed for most types of internet content is limited in rural Africa and Asia.

Skills for inclusion

Even when there is internet content relevant to people's lives, individuals need basic reading and writing literacy, as well as digital literacy, if they are to benefit from it. High-income countries, including the US, the Netherlands, South Korea and the UK, rank highly in the literacy sub-category in the Index, as do middle-income nations such as Kazakhstan and Malaysia.

Many countries' educational systems now prioritise teaching advanced digital skills to students in primary and secondary schools. This is of course critical for ensuring higher levels of digital literacy as students move into adulthood. Several middle-income countries, such as China, Colombia, Iran, Peru and Thailand, get high marks in the Index for their initiatives in this area, in addition to all the aforementioned countries.

The Index also includes a measure of digital skills training for teachers. According to Doyle Gallegos, who is global lead of the World Bank's Broadband Access for All programme, neglecting teacher training defeats the purpose of introducing digital skills courses: "It's no use setting targets for skills instruction if there are few teachers having the skills themselves." Mr Huter of the University of Oregon credits several Latin American and African governments, including those of Brazil, Ecuador, Ghana, Rwanda and Tanzania, with implementing successful initiatives to expand STEM (science, technology, engineering and mathematics) teaching and learning opportunities at different education levels.

Internet.org perspective on Readiness

Although connectivity is improving around the world, the gender gap is widening: women make up a smaller proportion of internet users today than in 2013 because men are connecting at a faster rate.[i]

In the average low-income country in the Index, 94% of the female population is offline, and 41% does not even have access to a mobile phone.

	Avg. % women offline	Avg. % women without mobile phone access
All countries	60%	17%
High Income	18%	6%
Upper middle income	53%	13%
Lower middle income	79%	16%
Low income	94%	41%

In the Inclusive Internet Index, differences in connectivity between men and women are measured as a component of Readiness, since lack of awareness and cultural norms often prevent women from getting online, particularly in developing countries.

The bottom line is that, by definition, if women are not online, the internet is not inclusive, independent of all other variables in the Inclusive Internet Index.

To understand the factors underlying the gender gap, researchers at Facebook conducted surveys in nine countries: India (focusing on Punjab, Andhra Pradesh and Gujarat), Brazil, Colombia, Guatemala, Uganda, Ghana, Kenya, Nigeria and Rwanda. In all countries, men were more likely than women to use the internet. While the factors underlying the gender gap varied by country, generalisable trends emerged:

1. **Education gap**: In all but one country studied (Brazil), more men than women completed primary and secondary school. In addition, in every country more men than women were literate in a language for which there is meaningful internet content.[ii] Women may, therefore, lack the necessary education for digital inclusion.

2. **Awareness gap**: In seven out of the nine countries studied (the exceptions being Brazil and Colombia), the proportion of women aware of

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i ITU, *ICT facts and figures 2016*.

ii The relevant languages were Hindi, Telugu, and Gujarati in India; Brazilian Portuguese in Brazil; Spanish in Colombia and Guatemala; English in Uganda, Ghana, Kenya and Nigeria; and Kinyarwanda in Rwanda.

the internet was lower than the proportion of men.[iii] In Nigeria, men were a full 27 percentage points more likely to have heard of the internet than women.

3. Affordability gap: Across eight of the nine countries studied (Brazil is the exception), men are more likely to have data-capable phones than women. It may be that it is less culturally acceptable for women to use phones that can access the internet. Phones that can access the internet generally cost more than phones that cannot, so affordability may be another contributor to the gender gap, particularly given that the men surveyed were more likely to be employed.

There is no one-size-fits-all solution to the internet gender gap, because the underlying factors vary from country to country. For this reason it is imperative that future research seeks to diagnose, at a country or even regional level, factors that prevent women from getting online in order to understand the best ways to ameliorate them. What is clear is that there is a dramatic and unacceptable gender gap in connectivity that we must address to ensure an inclusive internet for all.

iii   Participants were provided with a brief description of the Internet, then asked "Before today, have you heard of the Internet?"

Conclusion:
Implications for policy

As a final building block of Readiness, the Index also considers whether governments have developed a specific strategy to address inclusion and the fostering of internet access among underserved groups of the population. It also considers the existence of national broadband rollout targets among different groups and regions. Several middle- and lower-income countries, led by Malaysia, India and Nigeria, compare favourably with wealthy ones in these areas.

Although no low-income countries are among the leaders in Readiness, a handful, including Nepal, Mozambique, Burkina Faso and Uganda, rank considerably higher in this pillar—especially in policy development—than they do in Availability and Affordability. This suggests that inclusion gains may come faster here than in other low-income countries once they have more and better infrastructure in place.

Of course, strategy development is only half the battle. Implementation of otherwise well thought-out strategies lags in too many developing countries, according to several experts interviewed for this study. One of these is Antonio García Zaballos, lead specialist in telecommunications at the Inter-American Development Bank. "In Latin America, implementation of national ICT plans is too often an afterthought," he says. "Governments need to do more than draft national connectivity plans; they must also implement them."

The policy road ahead

Beyond the need for better implementation, our research highlights several considerations that can help policymakers and international development organisations to weigh carefully the advantages and disadvantages of their inclusion strategies.

The first is that more evidence is needed. Public policy must be guided to the extent possible by evidence that certain measures have led to positive outcomes in similar circumstances. This is no easy task. As Mr Gallegos notes: "We've only barely begun to quantify the impacts of approaches that have been taken. There's not yet much evidence to fall back on." The Inclusive Internet Index should be seen in this light: an attempt to shed more light on factors that may help advance the progress of inclusion initiatives at national and international level. Some have clear policy implications:

High-quality wireless broadband depends on fixed infrastructure. In the developing world, mobile and other wireless solutions offer the best hope of reaching the unconnected. But national and even some operator

strategies often pay insufficient attention to backhaul. Upgrading to fibre in the backbone is expensive but will eventually enable good 3G and 4G connectivity.

Realising gains from local hosting requires patience. In the long run, building more local IXPs should reduce prices for users and can lead to greater local content consumption. But it will take time: users need a reason to source more content locally and not internationally. And in the developing world, not all IXPs will prove commercially viable.

Changing men's attitudes may help to bring more women online. Where the digital gender gap is widest, especially in rural areas of low-income countries, prevailing cultural norms often limit women's access to the internet. Programmes aimed at changing this should involve men in the discussion. Greater awareness of the economic benefits could trump some cultural attitudes.

Train teachers as well as students. Education systems across the world are admirably adding digital skills coursework to primary and secondary school curriculums. But even in Europe and North America, learning is hampered by a shortage of teachers with the requisite knowledge. Volunteers are a stopgap, but teachers must also be a target of digital skills programmes.

If nothing else is taken from this study, it is that technology should never be viewed in isolation when considering inclusion. In designing new initiatives to connect the unconnected and foster greater internet use, stakeholders need to consider the range of socioeconomic, cultural, demographic, linguistic and other factors that contribute to inclusion. In some cases, such as in underserved rural areas, providing access by itself may be enough to get people using the internet. But in most other situations the content, skills, trust and other building blocks must also be in place.

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