Bridging the global digital divide

A platform to advance digital development in low- and middle-income countries

George Ingram

BROOKINGS GLOBAL WORKING PAPER #157
JUNE 2021

Center for Sustainable Development at BROOKINGS

Bridging the global digital divide: A platform to advance digital development in low- and middle-income countries

George Ingram
Senior Fellow, Center for Sustainable Development
Brookings Institution

June 2021
Brookings Global Working Paper #157
Global Economy and Development program at Brookings
www.brookings.edu/global

Acknowledgements
This paper is an expansion of an earlier paper, The Digital World, one of a series of six papers on donor collaboration in Southeast Asia. The author gives his appreciation to Tony Pipa for reviewing and providing significant input to the paper and to Meagan Dooley for updating the data and producing the data charts.

The United States needs to do more to ensure that these technologies are used to promote greater democracy and shared prosperity, not to curb freedom and opportunity at home and abroad. For example, a Biden Administration will join together the United States' democratic allies to develop secure, private-sector-led 5G network that do not leave any community, rural or low income, behind.

– Presidential candidate Joe Biden, Foreign Affairs, March/April 2020

Seventh, we will secure our leadership in technology.

– Secretary of State Tony Blinken, March 3, 2021

The Secretary of State is authorized to establish a program, to be known as the "Digital Connectivity and Cybersecurity Partnership".

– S.1169, Strategic Competition Act of 2021, Section 122
(reported by the Senate Foreign Relations Committee April 21, 2021)

Contents

Overview

The world is in the midst of a fast-moving, Fourth Industrial Revolution (also known as 4IR or Industry 4.0), driven by digital innovation in the use of data, information, and technology. This revolution is affecting everything from how we communicate, to where and how we work, to education and health, to politics and governance. COVID-19 has accelerated this transformation as individuals, companies, communities, and governments move to virtual engagement. We are still discovering the advantages and disadvantages of a digital world.

This paper outlines an initiative that would allow the United States, along with a range of public and private partners, to seize the opportunity to reduce the digital divide between nations and people in a way that benefits inclusive economic advancement in low- and middle-income countries, while also advancing the economic and strategic interests of the United States and its partner countries.

As life increasingly revolves around digital technologies and innovation, countries are in a race to digitalize at a speed that threatens to leave behind the less advantaged—countries and underserved groups. Data in this paper documents the scope of the digital divide. With the Sustainable Development Goals (SDGs), the world committed to reduce poverty and advance all aspects of the livelihood of nations and people. Countries that fail to progress along the path to 5G broadband cellular networks will be unable to unlock the benefits of the digital revolution and be left behind. Donors are recognizing this and offering solutions, but in a one-off, disconnected fashion. Absent a comprehensive, partnership approach, that takes advantage of the comparative advantage of each, these well-intended efforts will not aggregate to the scale and speed required by the challenge.

The U.S. recognizes digital as a developmental priority. Through recent policies and strategies, the Department of State has acknowledged digitalization as a diplomatic priority and the U.S. Agency for International Development (USAID) and the Development Finance Corporation (DFC) as a development priority. At the political level both President Biden and Congress have addressed the challenge and opportunity. As the U.S. returns to the international stage, digital development is an opportunity for the U.S., through “leading by partnering”, to offer the world a win-win.

State of digitalization

Reach of digital technology

Digitalization—living and operating in a digital culture—is not just the future. It is now, with the full potential yet unknown. The presence of digital devices and services is ubiquitous. It is transforming societies worldwide—government, industry, commerce, culture, personal lives—even if we do not fully comprehend all the ways it is doing so. Technological advancement is outpacing the ability of policies and regulation to provide protections and improve the chances that it will be channeled for positive rather than nefarious purposes. Digital technologies and connectivity have the power to improve development outcomes and lift millions out of poverty but also to heighten political divisions, undermine democracy, and exacerbate inequality. There is an urgent need not only to construct the physical infrastructure and software, but also to establish rules of the road and ensure that underserved populations have both the access and digital literacy they need to avoid being left even further behind.

The scope and reach of digital technology are hard to fathom. Given the relative ease of rollout and scalability, digital technology has the capacity to achieve a scale of impact of which interventions to date could only dream. Data travel distances in milliseconds and data solutions can serve local, national, and meta-national populations simultaneously, providing opportunities for communication and collaboration across physically dispersed populations that were previously unimaginable. Our daily lives are affected by e-commerce, e-finance, e-government, e-social communications, e-media, e-education, e-learning, and even e-gaming.

Digital technology is disrupting traditional means of communications, business, learning, how we function at work and at home, and even governing. It is speeding up and deepening access to information and communications, reducing the cost of technologies, driving productivity, boosting efficiency, speeding innovation, accelerating economic growth, empowering financial inclusion, building innovative and resilient solutions, and facilitating government transparency and citizen-government interaction. It is providing real-time information in humanitarian and crisis situations, as evidenced during the Ebola pandemic and now during COVID-19.[1]

Digital technology is putting people at the heart of products and services and empowering them. It is providing affordable education and learning materials for

—

1 Pathways to Prosperity Commission, 2019, p.40-41.

students, real-time weather and market information for poor farmers and fishermen, training for teachers, medical diagnosis and information for those living remotely, and financial services for the unbanked—services previously out of reach for remote areas and underserved populations.

Economic power of digital technology

Worldwide, cross-border data flows are rapidly expanding. In 2014, this arena generated more economic value than traditionally traded goods, accounting for $2.8 trillion of global GDP. They are projected to reach $11 trillion by 2025.[2] Globally, digital platforms—including e-commerce, digital media, and e-services—generated $3.8 trillion in revenue in 2019, $1 trillion in developing countries.[3]

The export of information and communications technology (ICT) goods totaled $1.9 trillion in 2017. ICT services reached $2.9 trillion in 2018. South Asia and Southeast Asia stand out for their dynamism in digital trade. In 2019, Southeast Asia accounted for 25 percent of global ICT trade in goods and South Asia for 28 percent of trade in services (see table 1). Seven of the top 10 ICT goods exporters are in East or Southeast Asia. In 2016, 15.5 percent of the global economy was digital, a figure projected to grow to almost 25 percent by 2025.[4]

Table 1. ICT exports by region as a share of total trade in goods and services, 2019

Region	ICT as % total trade in goods	ICT as % total trade in services
World	12.5%	10%
Europe	5%	11%
North America	7%	5%
Latin America & Caribbean	7%	5%
Middle East & North Africa	4%	8%
South Asia	2%	28%
Southeast Asia	25%	6%
Sub-Saharan Africa	0.4%	5%

Source: UNCTADStat (2021).

—

2 McKinsey Global Institute (2016), Digital globalization: The new era of global flows.
3 Asian Development Bank (2021). Asian Economic Integration Report 2021, pg.193.
4 Oxford Economics and Huawei (2017). “Digital Spillover: Measuring the true impact of the digital economy.”

As evidence of the economic power of digitalization, one assessment calculates that maximizing the digitalization of 16 emerging economies, deemed "Digital Sprinters", would unlock $3.4 trillion of potential value by 2030.

Challenges of digitalization

While digitalization can drive more inclusive economic growth and reduce poverty, the ramifications are not all positive. De-industrialization is a real threat. As with any economic disruption, the creative destruction of outdated business takes away jobs, often for an older, less mobile, less trainable generation. Digital jobs require more education. Expanding the use of digital can widen income disparity between individuals and countries, with the gains from digital accruing to those at the top of the pyramid. COVID-19 is widening the digital divide, as those with computer skills and internet access are able to continue learning and working and those without fall behind.

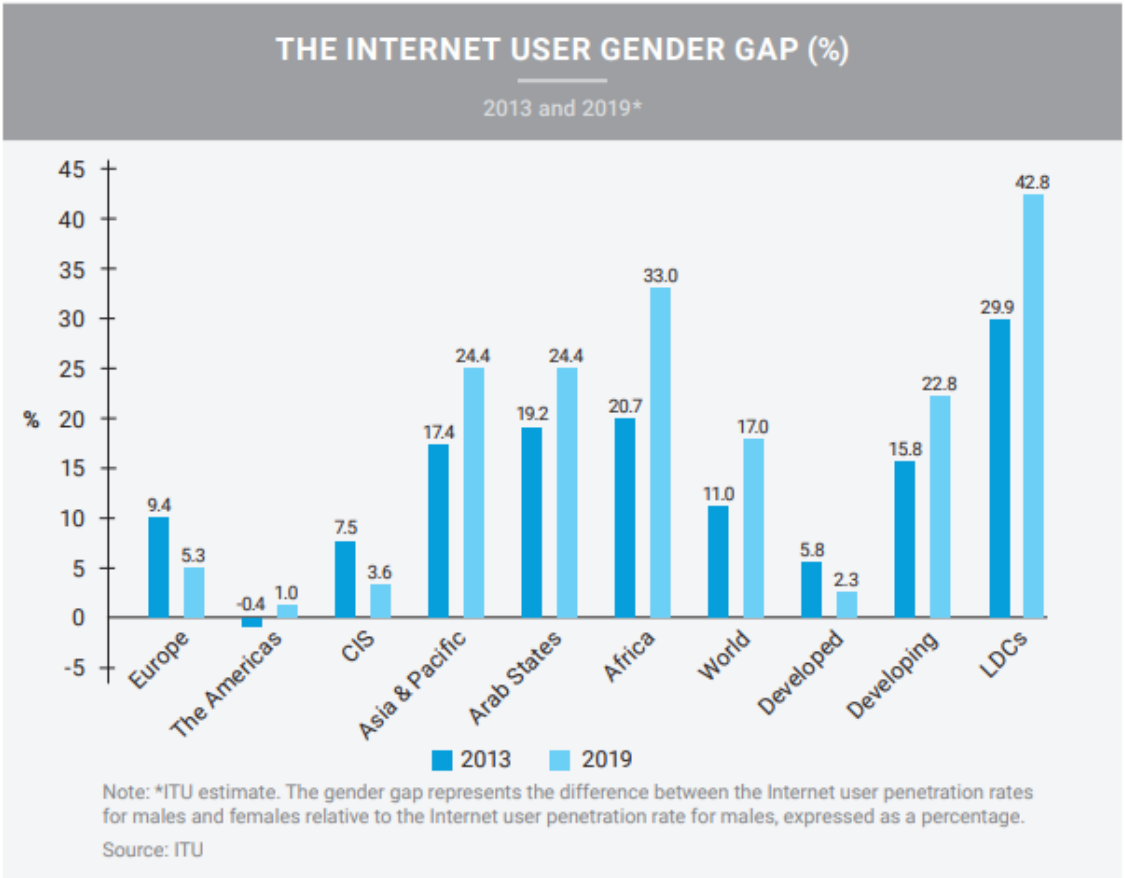
Digital platforms enhance the risk of personal security and the rapid spread of fake news that can drive a wedge in a populace and undercut democratic practices. They can facilitate misuse of data, intimidation, unchecked surveillance, and cyber terrorism and ransomware that disrupt the functioning of critical infrastructure. They can be exploited for hate speech and sexual abuse and empower autocratic government, terrorism, illicit finance, and criminal networks. The ethical use of digital technologies and the data it generates is a fundamental challenge that the world has barely begun to address. A digital divide is present between urban and rural areas. The seven largest metropolitan areas of Southeast Asia house 15 percent of the region's population but account for 50 percent of the internet economy.[5]

Women, in particular, have been shortchanged of the benefits of connectivity, with the gender divide in Internet use widening. Worldwide, approximately 327 million fewer women than men have a smartphone and can access the mobile Internet.[6] As shown in Figure 1,[7] in developing countries women are 22.8 percent less likely than men to use the internet the gap worsened by 5 percentage points between 2013 and 2019.

—

5 Google, Temasek, and Bain. E-Economy SEA 2019.
6 OECD, Bridging the Digital Divide, 2018, p.6
7 From Roadmap for Digital Cooperation, Report of the Secretary General, June 2020

Figure 1. Gender gap



Coverage and access

Connectivity is the connective tissue of digital. Access is more of an issue than coverage. As of 2020, 3G covered 93.1 percent of the world (96.7 percent for 2G). 3G coverage, outside of Europe and North America, varies from a high of 96.1 percent in Asia and the Pacific to a low of 77.4 percent in Africa (see Table 2)[8]. Some 3.6 billion people in developing countries do not have access to the internet. Access ranges from a high of 76.4 percent for Central Asia to a low of 14.3 percent for Africa. From 2018-2019, the world added 226 million internet users, about 620,000 a day, the largest growth occurring in Asia and the Pacific.

—

8 ITU World Telecommunication/ICT indicators database (2020)

Table 2. Share of population covered by wireless networks and with internet access, 2020

Region	3G Coverage	Internet access	New users added daily (2018-2019)
World	93.1%	57.4%	620,000
Africa	77.4%	14.3%	85,000
The Americas	95.5%	69.8%	72,000
Europe	98.3%	85%	49,000
Asia and Pacific	96.1%	53.4%	370,000
Central Asia	88.7%	76.4%	22,000
Arab States	90.8%	58.9%	55,000

Source: ITU World Telecommunication/ICT Indicators database (2020)

While internet usage has increased dramatically in recent years, usage rates vary widely. South Asia and sub-Saharan Africa have the lowest access rates (20 percent and 19 percent) and the narrowest spreads among countries, with the best-performing countries having 60 percent of the population with internet access. Regional averages ranging from 47 percent to 66 percent in Latin America, the Middle East, and Southeast Asia mask large discrepancies in country performance, with the best-performing countries having over 80 percent access and the worst performing countries around 20 percent access.

Table 3. Internet access by region, with variance between highest and lowest country, most recent year

Region	Internet access	High	Low
Europe and Central Asia	84%	Liechtenstein (99%)	Turkmenistan (21%)
North America	88%	Bermuda (98%)	United States (88%)
Latin America & Caribbean	66%	Aruba (97%)	St. Vincent & Grenadines (21%)
Middle East & North Africa	65%	Bahrain (100%)	Libya (22%)
South Asia	20%	Maldives (63%)	Afghanistan (11%)
Southeast Asia	47%	Malaysia (84%)	Laos (26%)
Sub-Saharan Africa	19%	Mauritius (64%)	Eritrea (1.3%)

Source: World Bank World Development Indicators (2020)

Initiative to bridge the digital divide

Digital technology is becoming, not only foundational to global economic competition and progress in developing countries, but also the equivalent of the big power ideological and strategic battles of the Cold War-era. This is the case not only in Southeast Asia, the most economically dynamic area of the world that is home to seven lower-middle-income countries (LMICs)[9] with development aspirations and a major center of economic and geopolitical competition, but also in Africa, Latin America, and the Middle East. This challenge is a unique opportunity for donors to join in a collaborative initiative to help countries leapfrog into the 21st century digital world while at the same time advancing their own economic and strategic interests.

In answer to the current disparate, disconnected activities of donor nations, and as a means to take action on the findings and recommendations of the National Commission on Artificial Intelligence, the U.S. could launch a major "ending the digital divide initiative" that could catalyze, or serve as, a multi-donor, multi-party platform that would bring coherence to efforts to advance digital development in developing countries. The scope of the initiative would cover infrastructure, policy reform, interoperability, cybersecurity, and capacity building. Such an initiative would provide the opportunity to address these interconnected issues—and attract the necessary scale of investment—to unleash the vast potential for digitalization to accelerate development outcomes and set the technical and policy framework for digital development for the coming decades.

U.S. strategy and tools

The U.S. government, particularly USAID, brings three significant assets to a digital initiative—strategies, tools, and a model—that would serve to lay the foundations for a discussion with potential partners—governments, international organizations, private sector, and civil society organizations.

The USAID Digital Strategy 2020-2025,[10] released in April 2020, is targeted at "strengthening the openness, inclusiveness, and security of country digital ecosystems". The components of the strategy are enabling sound government policy and regulation, robust and resilient digital infrastructure, capable digital service providers and workforce, and empowered end-users. The strategy is structured to

—

9 Cambodia, Indonesia, Laos, Myanmar, Philippines, Timor-Leste, and Vietnam
10 USAID. Digital Strategy 2020-2024

engage the private sector as a partner and promote the adoption of appropriate international standards and best practices. It includes strengthening cybersecurity and protection of data privacy and responsibility. It is designed to address gaps in governance policy and standards, market failures, and the security and resilience of partner country digital ecosystems.

The strategy includes a country digital diagnostic methodology, the Digital Ecosystem Country Tool (DECA), which has been used to conduct a digital diagnostic for Colombia and Kenya. In addition, USAID has a Digital Investment Toolkit that provides thirteen best practices and can be used to determine where a country is along the digital development spectrum.

Further, specific to the Indo-Pacific region, in 2018 the Department of State and USAID launched the Digital Connectivity and Cybersecurity Partnership (DCCP), designed to engage the private sector in communications infrastructure development, promote regulatory reform for competitive digital markets, and strengthen cybersecurity capacity. It promotes open, interoperable, and secure communications networks. In partnership with government, private sector, and civil society, the initiative sets out specific priorities to advance:

- rules-based policies
- international standards and best practices
- investment in infrastructure
- digital skills
- civil society's role in advocacy and accountability
- security from privacy abuse, cybercrime, and misinformation
- trafficking in people and illicit goods.[11]

Also positioned to play a part is the Infrastructure Transition and Assistance Network (ITAN), a U.S. interagency endeavor to catalyze private sector investment in the Indo-Pacific. According to the Asian Development Bank, infrastructure needs in the region are projected to be $1.7 billion per year for the foreseeable future.

Model: Power Africa

The model for the initiative is the successful U.S. program Power Africa, launched in 2013 to identify and remove constraints holding back high-value energy projects in Africa. To understand the reach and potential impact of such an initiative, Power Africa today joins the assets of over 170 public and private partners, including twelve U.S.

—

11 USAID, Advancing Digital Connectivity in the Indo-Pacific Region, 2018

government agencies, other bilateral donors, international organizations, companies, and civil society organizations. Financial commitments from all partners have totaled $56 billion, about $16 billion from public sector entities and $40 billion from the private sector. In seven years, Power Africa has brought to closure 126[12] power generation deals (52 are now operational), valued at an estimated $21 billion and bringing power to 16 million homes and businesses representing 88 million beneficiaries. USAID has invested over $500 million in the program. Another $70 million has come from the U.S. Trade and Development Agency and $11 million from the U.S. Africa Development Foundation. The role of the Overseas Private Investment Corporation (OPIC), an original partner, has been assumed by its successor, the DFC.

The digital gaps are notable in five broad areas—infrastructure, government policy and regulation, interoperability, cybersecurity, and digital skills. Power Africa offers a variety of support tools—finance, transaction assistance, technical advice for policy and regulatory reform, capacity building, and legal assistance. These instruments are all relevant to digital, but one additional element is needed—enhancement of the digital skills of government, business, civil society, and individuals.

As an example of the potential roles of U.S. government agencies in a digital initiative, USAID would serve as the hub. All participating U.S. government agencies could identify potential opportunities. USAID would work with relevant agencies to vet and develop project opportunities and would provide support through technical assistance for government policy and regulations, transaction and legal assistance, and capacity building for government, business, civil society, and individuals. The Department of State, as outlined in the report of the National Commission on Artificial Intelligence, could contribute its diplomatic weight at the policy level.[13] The DFC, with a strategic commitment to supporting investments in "open, interoperable, reliable and secure digital infrastructure and internet access,"[14] would play a central role in vetting investment projects for which it would provide financing (debt and equity), political risk insurance, and technical assistance. The Trade and Development Agency (USTDA) would support feasibility studies and procurement standards and reform. The Millennium Challenge Corporation (MCC) could include a digital component to its country compacts. The Export-Impact Bank would finance exports.

—

12 Power Africa Annual Report 2020; https://www.usaid.gov/powerafrica
13 As proposed in S.1169, Strategic Competition Act of 2021 – section 208 proposes a Technology Partnership Office at the Department of State
14 Development Finance Corporation, Roadmap for Impact

Partners

Bridging the digital divide and setting common rules of the road are bigger than any one donor. Building and innovating the infrastructure and software required to fuel digital development is beyond the capability of government and requires partnership with the private sector. Civil society can play important roles in facilitating partnerships, policy development, advocacy, and accountability.

Various donors are actively involved in the digital arena and would serve as ready partners in this endeavor. Linking their work to a common effort would produce a more coherent, efficient approach.

Here are several examples of donors that have prioritized digital development. Australia has a Technology for Development initiative designed to "improve connectivity and access to the internet across the Indo-Pacific, encourage the use of resilient development-enabling technologies for e-governance and the digital delivery of services, and support entrepreneurship, digital skills and integration into the global marketplace." Digitalisation for Development presents Norway's policy and priorities in its digital development cooperation.

Belgium has a policy Digital for Development (R4D) for the Belgian development cooperation which envisions digitalization not "as a goal in itself, but as a crosscutting enabler to achieve better results…" Germany has the Digital Strategy of the Federal Ministry of Economic Cooperation and Development focused on work, local innovations, equal opportunities, good governance and human rights, and data for development. Its Digital Toolkit serves as an introduction to becoming involved in digital development. Digital change in development cooperation provides an overview of the reach of Germany's development cooperation involvement in digital. Switzerland references its development cooperation work in Digital Foreign Policy Strategy 2021-2024

Multilateral organizations are also significant actors in digital development. The World Bank has guidelines and tools, with a reach throughout the developing world, that would make it an important partner in the initiative. The World Bank's strategy Digital Development covers five key elements—digital infrastructure, financial services and identification, innovation and entrepreneurship, platforms, and literacy and skills. It's Digital Economy Initiative for Africa (DE4A) specifically supports the African Union's Digital Transformation Strategy for Africa (2020-2030). It has Digital Development Toolkits covering broadband, cross-sector infrastructure, cloud readiness assessment, engendering ICT, digital government readiness assessment, and digital capabilities knowledge map.

The Inter-American Development Bank (IDB) published Broadband Policies for Latin America and the Caribbean: A Digital Economic Toolkit. It houses Social Digital, designed to leverage technology for more and better social services in five sectors—health and social protection, education, labor, social security, migration, and gender and diversity. It maintains the Electronic Government Network of Latin American and the Caribbean that links digital government authorities in the region to promote cooperation, citizen-centered digital government policies, training of public officials, and exchange of experiences and solutions. It also hosts Fintech that links financial regulators and supervisors and fintech associations.

The Asian Development Bank (ADB) has a digital strategy, Toward E-Development in Asia and the Pacific, that sets out three "thrusts"—create an enabling environment, build human resources, and develop ICT applications and information content. The European Bank for Reconstruction and Development lays out its strategy in ICT—Enabling Growth and Development Sector Strategy 2020-2024.

While the U.S., with its global interests and strong digital foundation, would likely be involved throughout the world in the initiative, there is a potential natural regional division of labor among donors—partners for either a U.S.-led or a global platform—and an important and relevant role for Southern digital leaders.

For example, based on the E-Government Survey 2020, five countries in Asia rank among the 14 top digital performers. Australia, New Zealand, South Korea, Singapore, Japan could join with the U.S. to bring their digital capabilities to developing countries in Asia. Australia, Japan, and the U.S. already have a framework for collaboration in digital connectivity in their agreement to collaborate through the Trilateral Infrastructure Partnership for the Indo-Pacific. South Korea, in particular, would appear to be a ready partner, as the fact sheet accompanying the joint statement from the May 21, 2021, meeting of Presidents Joe Biden and Jae-in Moon included a commitment to partner to "Promote ASEAN centrality and advance new development cooperation between USAID and the Korea International Cooperation Agency in Southeast Asia to … expand cooperation on connectivity, build digital capacity and cyber-security."

Just as an example of the experience a regional leader can bring, in 2000 Singapore launched the e-Government Action Plan that digitized a range of government services. In 2014, it established the Smart Nation to deploy technological solutions to urban challenges. Building on that, Infocomm Media 2025 sets the ambitious goal of making Singapore number one in the world in using digital technology, specifically targeting four areas: productivity growth, creation of high-skilled jobs, support for an aging

population through health solutions and services, and strengthening national identity through the collective pursuit of positive social goals.[15]

Furthermore, ASEAN, places a high priority on digital connectivity, as evidenced by it serving as a key topic in various plans and strategies—ASEAN Digital Framework, 2019 ASEAN Outlook on the Indo-Pacific, Asian Community Vision 2025, and most recently ASEAN Digital Master Plan 2025.

The Scandinavian countries of Denmark (number one in the E-Government Survey), Finland (3), Sweden (6), and Norway (13) could combine their digital advancement with their strong development interest in Africa to take the lead there. In the Americas the partners might be the three donor countries with the greatest interest and history in the region—the U.S., Canada, and Spain—joining with the four Southern partners of Chile, Brazil, Costa Rica, and Mexico, each of which ranks in the top quarter of digital performers, to form a North-South partnership.

Estonia, recognized as the most comprehensively digital advanced and integrated country in the world, would bring considerable experience and knowledge to the initiative.

The private sector, represented by hundreds/thousands of companies and organizations such as the mobile communications industry alliance GSMA, would be an essential part of this partnership. It is the private sector that possesses the technology, the management skills, the supply chains, the capability to innovate, the finance, and the ability to monetize and move to scale that is essential to spreading digital throughout the world.

Civil society organizations would play a role in policy, advocacy, accountability, and communicating the needs of the less advantaged and ensuring approaches are inclusive. Civil society partners touch on a range of aspects of digital development and include organizations such as the Digital Public Goods Alliance, Digital Impact Alliance (DIAL), Better than Cash Alliance, ID 2020, MOSIP, Mojaloop, Open Government Partnership, and Open Partnering Partnership. Innovation and partners in leverage financing for digital development could come from working with the Contact Group on Financial Digital Public Goods, and approaches to digital government from partnering with the Digital Impact and Governance Initiative.

A public-private partnership that could be associated with the initiative is the new alliance of the International Telecommunication Union (ITU), the Ministry of Foreign

—

15 Lin, Diaan-Yi. "What Makes Singapore's government a digital leader – and how it might do better"; Government of Singapore—https://www.edb.gov.sg/en/news-and-events/insights/innovation/government-leads-digital-disruption-in-singapore.html

Affairs of the Republic of Estonia (MFA Estonia), German BMZ, and DIAL to accelerate digital transformation and digitalization of governmental services for achievement of Sustainable Development Goals (SDG), particularly in low-resource settings. "The collaboration will establish a global high-level framework for digital government cooperation to assist countries in implementing scalable digital services and applications in a cost efficient, accelerated and integrated manner."

Guidelines for how to best advance the digital ecosystem, including partner collaboration, are readily adaptable from the Principles for Digital Development.

Urgency

Two factors add to the rationale, even urgency, for such an initiative. One is the global competition, both commercial and strategic, to secure market development of 5G and other digital services and technologies. The other is the economic retrenchment and growing debt burden of developing countries calls out for donor assistance in de-risking the massive public and private investment needed for digital infrastructure and the companion policy and administration reforms. Sovereign debt levels in 2020 rose by 12 percentage points of GDP in middle income countries and 8 percentage points in low-income countries, due principally to both higher borrowing to financing COVID-19 recovery efforts and falling GDP.[16] Even before the pandemic hit, half of all low-income countries were in debt distress or at high risk. Developing countries owe $350 billion in debt service on public and publicly guaranteed debt in 2021, and another $334 billion in 2022.[17] This level of debt makes access to external capital difficult and expensive and calls out for significant support from donors.

Either a U.S.-driven, or a multi-donor, public/private partnership would be a 10-25-year high-profile, pragmatic initiative that would ramp-up the digital capacity for the economic, social, and governmental development of low- and middle-income countries. Not only would it reduce the time to narrow the digital divide, it would also advance the foreign policy and economic interests of the partner countries. These overarching common interests and the potential impact should provide the incentives for donors to overcoming their individual priorities and differing budget and program requirements to align behind an initiative to leapfrog developing countries into the digital 21st century.[18]

—

16 Peter Breuer and Charles Cohen, "Time is Ripe for Innovation in the World OF Sovereign Debt Restructuring," IMF Blog, November 19, 2020, https://blogs.imf.org/2020/11/19/time-is-ripe-for-innovation-in-the-world-of-sovereign-debt-restructuring/?utm_medium=email&utm_source=govdelivery.
17 World Bank International Debt Statistics database (2021).
18 See Runde et al "Post-pandemic Infrastructure and Digital Connectivity in the Indo-Pacific" for a proposal for a U.S. digital infrastructure investment plan for the broader Indo-Pacific region.

As international digital and telecommunications infrastructure investment needs continue to grow and China continues to use digital development to export authoritarianism and expand influence, the United States and its allies and partners must join forces to coordinate a strategy that maximizes the impact of government assistance efforts and also catalyzes private-sector investment to address shared challenges.

– National Security Commission on Artificial Intelligence,
Chapter 15: A Favorable International Technology Order

References

Accenture Strategy and Global e-Sustainability Initiative. “System Transformation: How digital solutions will drive progress towards the sustainable development goals”.

AlphaBeta, The Digital Sprinters, November 2020.

Alliance for Affordable Internet. 2019. "2019 Affordability Report."

ASEAN. 2016. “Master Plan on ASEAN Connectivity 2015”.

ASEAN. “ASEAN Digital Integration Framework”.

ASEAN Economic Ministers. 2018. ASEAN Digital Integration Framework Action Plan 2019-2025”

Asian Development Bank (2021). Asian Economic Integration Report 2021, pg.193.

Banga, Karishma and Dirk Willem te Velde. 2019. *Preparing developing countries for the future of work: understanding skills-ecosystem in a digital era.* Overseas Development Institute.

Breuer, Peter and Charles Cohen, “Time is Ripe for Innovation in the World OF Sovereign Debt Restructuring,” *IMF Blog*, November 19, 2020

Cisco Research. *Modeling an Inclusive Digital Future.*

Department of Foreign Affairs and Trade, Government of Australia. *Strategy for Australia’s Aid Investment in Economic Infrastructure.*

Development Finance Corporation. *Roadmap for Impact, 2019*

Digital Impact Alliance. 2018. *Financing Digital Markets: What vaccines can tell us about scaling digital technologies in low- and middle-income countries.*

FACT SHEET: United States – Republic of Korea Partnership, May 21, 2021.

Google, Temasek, and Bain. 2019. *E-Conomy SEA 2019.*

GSMA. 2014. *Assessing the case for Single Wholesale Networks in Mobile Communications.* Accessed Februarn 19, 2020.

Federal Ministry for Economic Cooperation and Development of Germany. *Toolkit 2.0—Digitalization in Development Cooperation.*

GSMA. 2017. “Connected Society Unlocking Rural Coverage: Enablers of commercially sustainable mobile network expansion”.

GSMA. 2017. "Unlocking Rural Coverage: Enablers for commerdcially sustainable mobile network expansion."

GSMA. n.d. "Wholesale Open Access Networks." Accessed February 24, 2020. https://www.gsma.com/spectrum/wp-content/uploads/2017/07/GSMA_SWN-8-pager_R3_Web_Singles.pdf.

Ingram, George. “The Digital World”. Brookings, 2020.

International Telecommunciations Union [ITU]. 2019. ICT Price Basket.

KOICA. “Digital Partnership for Inclusive Development in ASEAN”.

Lin, Diaan-Yi. December 2016. “What Makes Singapore’s government a digital leader—and how it might do better.” McKinsey&Company.

McKinsey Global Institute (2016), Digital globalization: The new era of global flows.

McKinley, Shelly. 2019. "Opinion: High-speed internet—the linchpin for sustainable development." *Devex.* November 20.

National Security Commission on Artificial Intelligence, The Final Report.

Runde, Dan, Conor Savoy, Owen Murphy. November 2020. “Post-pandemic Infrastructure and Digital Connectivity in the Indo-Pacific”. Center for Strategic and International Studies.

OECD. 2018. "Bridging the Digital Gender Divide: Include, Upskill, Innovate."

OECD. 2019. *Going Digital: Shaping Policies, Improving Lives.* Paris: OECD Publishing.

OECD. 2016. "Skills For a Digital World." Background Paper.

Oxford Economics and Huawei (2017). “Digital Spillover: Measuring the true impact of the digital economy

Pathways for Prosperity Commission. 2018. "Charting Pathways for Inclusive Growth."

Pathways for Prosperity Commission. 2019. "The Digital roadmap: how developing countries can get ahead." Oxford.

Republic of Estonia, “ITU, Estonia, Germany and DIAL to Collaborate on Efforts to Accelerate Digital Transformation and the Achievement of Sustainable Development Goals”

Senate Foreign Relations Committee, S.1169, Strategic Competition Act of 2021

Singapore Government website—https://www.edb.gov.sg/en/news-and-events/insights/innovation/government-leads-digital-disruption-in-singapore.html

Singapore Government website. Infocomm Media 2025. https://www.mci.gov.sg/portfolios/infocomm-media/infocomm-media-2025

Stromseth, Jonathan. 2019. “Don’t Make Us Choose: Southeast Asia in the throes of US-China rivalry”.

UN. Roadmap for Digital Cooperation, Report of the Secretary General, June 2020

UN Secretary-General's High-Level Panel. n.d. "The Age of Digital Interdependence."

USAID. 2018. “2018 Digital Download”.

USAID. 2018. “Advancing Digital Connectivity in the Indo-Pacific Region”.

USAID. “Digital Connectivity and Cybersecurity Partnership”.

USAID. 2020. “Digital Strategy: 2020-2024”. “

White House. United States. November 17, 2018. Joint Statement of the Governments of the United States, Australia, and Japan”.

White House. United States. November 13, 2018. “U.S.-Japan Joint Statement on Advancing a Free and Open Indo-Pacific Through Energy, Infrastructure and Digital Connectivity Cooperation”.

World Bank. 2016. Digitial Adoption Index. *World Development Report 2016: Digital Dividends*.

World Bank -- Vyjayanti T. Desai, Alan Gelb, Julia Clark, Anna Diofasi**.** “Ten Principles on Identification for Sustainable Development”. February 7, 2017.

World Bank. 2019. *The Digital Economy in Southeast Asia: Strengthening the Foundations for Future Growth.* Washington: Information and Communications for Development.

World Bank. 2020. World Development Indicators.

World Economic Forum. 2018. Global Competitiveness Index 2017-2018.

World Justice Project. 2019. Rule of Law Index.

World Wide Web Foundation. n.d. "React with Gender-Responsive ICT Policy."

Yoo, Tae, Mary de Wysocki and Amanda Cumberland. 2018. Country Digital Readiness: Research to Determine a Country’s Digital Readiness and Key Interventions. Cisco Research: Modeling and Inclusive Digital Future White Paper.

1775 MASSACHUSETTS AVE NW
WASHINGTON, D.C. 20036

brookings.edu/SustainableDevelopment