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Closing the Digital Divide:

A Human-Centered Approach to Connectivity

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Foreword

The COVID-19 pandemic has rapidly increased social and economic disparities between and within societies around the world. This gap disproportionately affects people experiencing income and housing insecurity, in addition to racial and ethnic minorities, seniors, women and girls, people with low literacy, and traditionally marginalized groups. To build back better, we encourage a renewed consensus that all people should have the tools necessary to reliably access the internet and the educational, employment, health, financial, and government services that it enables.

The international community's discussion of connectivity often focuses too narrowly on infrastructure and networks rather than on taking a human-centered approach to the challenges. Microsoft global efforts to increase access to broadband internet and digital skilling have informed our human-centered approach to closing the digital divide. We define *human-centered connectivity* as a combination of access, by ensuring the availability of affordable connectivity and devices; readiness, by building digital literacy and skills; and applications, by enabling individuals to receive the benefits of basic human services, like education, health care, and economic development. In this paper, we highlight internet adoption, affordable technology, and sustainable financing as the three pillars of action for closing the digital divide for individual users, including opportunities and mechanisms to make meaningful progress toward universal connectivity.

We recognize and affirm the vital role of the United Nations (UN) system in accelerating global action to achieve the Sustainable Development Goals (SDGs), which include reaching meaningful universal connectivity for all people everywhere.



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Introduction

The digital divide poses a serious, global, and urgent challenge to inclusive and sustainable growth. Currently, only 2.5–3 billion individuals are both connected to broadband and can afford to use it. Experts believe that another 2.5–3.5 billion have access to a connection but cannot afford to take advantage of it. The remaining billion are entirely unconnected.

Closing this divide, by enabling meaningful, universal connectivity around the world, is critical to advancing global development priorities and will require thoughtful, tailored approaches suited to local conditions. Programs and policies should be mindful of the end user's perspective—whether urban or rural, affluent or underserved, or digitally literate or not. The momentum is now: stakeholders in government, industry, civil society, and international organizations have expressed renewed willingness to act, intensified by the impacts of the COVID-19 pandemic.

To progress, it is important to take a human-centered approach. Currently, the international community is too focused on the infrastructure components of connectivity rather than on addressing all barriers to adoption. A human-centered and technology-agnostic approach to defining and advancing connectivity is paramount and should focus on people's ability to afford, adopt, and use technology rather than on simply increasing the deployment of technology without regard for equitable adoption and use.

In the digital age, access to the internet is increasingly necessary for individuals to better exercise their internationally recognized human rights. Without it, they will be unable or unwilling to fully take advantage of the economic and social advantages offered to those with unencumbered access to the digital ecosystem. We need to advance global rules of the road about how states and private-sector actors should engage in cyberspace, including recognizing that human rights apply online just as they apply offline. Private and public services must respect rights, including the rights to development, health, education, work, privacy, freedom of expression, and nondiscrimination.

We encourage multistakeholder action, in line with the Sustainable Development Goals (SDGs) and the *Secretary General's Roadmap for Digital Cooperation*,¹ to achieve meaningful and affordable connectivity for all, including in last mile areas. This will require partnerships and innovation across policy, technology, and business models to advance three major pillars: internet adoption, affordable technology, and sustainable financing.

¹ United Nations, *Secretary General's Roadmap for Digital Cooperation*. <https://www.un.org/en/content/digital-cooperation-roadmap/>

The Microsoft approach to the digital divide

Our experience with customers around the world helps us offer a definition of human-centered connectivity as a combination of access, by ensuring the availability of affordable connectivity and devices; readiness, by building digital literacy and skills; and applications, by enabling individuals to receive the benefits of basic human services, like education, health care, and economic development.

DEFINING HUMAN-CENTERED CONNECTIVITY	
Access	Ensuring the availability of affordable connectivity and devices
Readiness	Building digital literacy and skills
Applications	Enabling individuals to receive the benefits of basic human services, like education, health care, and economic development

Through the Microsoft Airband Initiative, we partner with internet service providers, telecom equipment makers, nonprofits, and local entrepreneurs to advance digital equity—access to affordable internet, affordable devices, and digital skills—as a platform for empowerment and digital transformation around the world. Our partners make it easier and more affordable for people to get online and participate in today’s economy. Additionally, as communities get connected, Microsoft partners with national and local organizations to provide digital skills training for people of all ages to help ensure that they have the confidence to navigate the internet—improving education, health care, agriculture, and small business outcomes in these communities.

Microsoft encourages a holistic approach to making sure that global broadband is robust, ubiquitous, evolving, and affordable, with a particular focus on the unserved and the underserved. Access to the digital ecosystem has the potential to be the great equalizer in society, and all stakeholders must work together to achieve universal connectivity. To reach universal, meaningful connectivity, we propose prioritizing three pillars.

KEY PILLARS FOR ACTION	
Internet adoption	Measure the breadth and equity of internet usage, and ensure that all people have the devices, skills, and tools needed to reliably access basic human services, health care, economic development opportunities, and education.
Affordable technology	Ensure access to affordable infrastructure by taking a technology-agnostic approach—lowering cost without sacrificing utility.
Sustainable financing	Enable sustainable and affordable financing through blended finance models and multistakeholder partnerships.

Key pillars for action: Overcoming the challenges to connectivity

Overcoming the barriers to connectivity will require partnerships between and within stakeholder communities. Given the central role of the United Nations (UN) in addressing global challenges and given its convening power, thought leadership and advocacy can and should come from within the UN system, while international financing institutions should be at the forefront of financing leadership.

Internet adoption

Access to the internet—even with an affordable connection—cannot be fully exploited without the right tools and enabling environment. In order for relevant digital skills to be built into basic learning and educational curricula, we need to develop new cross-sectoral partnerships. Collaboration and coordination between and among multilateral development banks, technology companies, education and service providers, governments, and other organizations to serve the underserved are paramount to achieving human-centered connectivity programming. This programming should take into consideration the needs of those with varied physical, intellectual, and language abilities. To give an internet connection to someone without digital skills is akin to giving a book to someone who has never been taught to read.

Fostering internet adoption should take into account the deep disparities among and within countries and regions. We encourage stakeholders, including bilateral and multilateral development organizations and private industry, to consider marginalized and underrepresented groups when developing their connectivity programs and to push for protective policies that create a level playing field. But more work remains to be done to have a fuller understanding of how and where to allocate resources. The international community needs more data on where connectivity gaps are greatest, the populations most impacted by a lack of connection, and those at greatest risk of being left behind.

We can also increase adoption by making devices—and their usage—cheaper and more readily available to populations with no or low connection. It is important to advance our collective understanding of how these tools can be tailored to meet local needs and skills. Services must be accessible to everyone, without discrimination, with a particular emphasis on access for vulnerable groups so that, per the SDGs, no one is left behind. This means that services must be physically, financially, and culturally accessible, without discrimination, in urban and rural settings, in majority and minority languages, and for all groups and persons.

We encourage international organizations, particularly the International Telecommunication Union (ITU), to lead a process that results in agreed-upon international metrics for the breadth and equity of broadband internet usage.

Affordable technology

Like financing solutions, the means of boosting affordability will depend on local conditions. Measures to promote affordability must be tailored to each country or region and community, based on purchasing power parity, to ensure that sustainable business models can thrive to deliver the last mile of connectivity. Ensuring affordability requires

using infrastructure that lowers costs without sacrificing utility. One way to help improve affordability is to deploy wireless technologies, such as Wi-Fi and TV white space (TVWS), which use license-exempt spectrum.

The history of technology distribution makes clear that when innovations can move wirelessly, they will reach the underserved faster and at a lower cost. The technology investments needed to achieve connectivity must incorporate the most efficient technologies—including alternative approaches, when necessary and available. These could be low-Earth orbit (LEO) satellites, shared spectrum, fixed wireless/Wi-Fi, and fiber. ITU's *Last-mile Internet Connectivity Solutions Guide*² offers a comprehensive guide to affordable alternative technologies.

As stated in the 2020 *Cisco Annual Internet Report*,³ “one of the main solutions to meet the demands of the increasing demand for bandwidth has long been leveraging Wi-Fi networks, which enable operators to scale capacity to meet their subscribers’ needs.” Sometimes the most suitable approach will depend on access to license-exempt spectrum, and it is important that governments’ spectrum policies facilitate deployment of license-exempt technologies. Indeed, Wi-Fi plays a major role in providing connectivity and carries the bulk of wireless internet traffic, even in areas that are well-connected with fiber and 4G services. The new Wi-Fi 6 standard supports a maximum throughput of 10 Gbps and will enable dense IoT deployments. It is therefore important that governments are allocating sufficient bands of license-exempt spectrum to help support expansion of both connectivity and capacity.

Institutions that provide financial, technical, or other assistance to connect communities often lack the proper capacity to implement human-centered connectivity solutions. Twenty-first century technologies, like artificial intelligence (AI) and 5G, can be utilized to enable these alternative approaches—but only with the right expertise and safeguards to uphold human rights.

Mobile devices are one way to enhance connectivity, but they are complementary to fixed connections and devices, which are needed to properly utilize the internet for school, work, and other applications. Putting mobile technology at the forefront of deployed solutions can hinder achieving holistic, human-centered solutions.

Sustainable financing

The international community should step up financing to achieve affordable broadband internet. Besides technical elements of connectivity, financing efforts must include human-centered elements, including literacy, skills, equity, basic services, and affordability.

Financing should be tailored and rooted in local solutions. Development assistance organizations and stakeholders in the private sector should partner to understand which business models and technologies will work best for a community, based on a variety of factors. Connectivity financing needs to fund programming that is technology agnostic, using the most appropriate technical solutions to address the major constraints to connectivity in each situation, such as using LEO satellites, fixed wireless systems, and shared spectrum technologies, in addition to fiber and mobile services, where practical. Examples include

² International Telecommunication Union, *The Last-mile Internet Connectivity Solutions Guide*. <https://www.itu.int/en/ITU-D/Technology/Pages/LMC/LMC-Home.aspx>

³ Cisco, *Annual Internet Report (2018–2023)*, white paper, March 9, 2020. <https://www.cisco.com/c/en/us/solutions/collateral/executive-perspectives/annual-internet-report/white-paper-c11-741490.html>

successful programs which show that in less densely populated areas, LEO satellites or technology approaches, such as fixed wireless and shared spectrum technologies, may be better equipped to deliver a connection than is fiber.

The international community should pay particular attention to the sustainability of financing. Technologies and business models with the lowest cost that deliver the most value—both for investors and end users—will differ per region. The path to sustainable connectivity for all must include blended financing partnerships between the private sector, multilateral organizations, governments, and local community networks,⁴ where appropriate. Financing decisions must also consider the other aspects of increasing connectivity, such as affordability and adoption. These resource requirements are relatively small compared to the infrastructure requirements, but they are no less important. Sometimes, subsidies or other measures are required to boost affordability, and programs to promote skills should be built into all connectivity projects.

The stakeholder community must also encourage and, when appropriate, use investments to incentivize policy reforms by governments. In many countries and regions where connectivity is lowest or the digital divide is greatest, government policy and regulation are actually preventing connectivity, not facilitating it. Furthermore, financing should go to connectivity programs based on an analysis of needs—not based on government demands that do not always take into account the primary underlying constraints.

Financing solutions must acknowledge and take action to remedy the fact that there are deep disparities in access to connected devices. These disparities impact women, children, migrants, ethnic and religious minorities, people with disabilities, members of the LGBTI community, people living in poverty, and older persons, among other marginalized groups.

⁴ Internet Society, “Community Networks.” <https://www.internetsociety.org/impact-report/2019/community-networks/>

Conclusion

It is important to move beyond definitions of connectivity that solely focus on infrastructure and to adopt a more human-centered framework—a combination of access, readiness, and applications. To do so, Microsoft urges action on the three pillars outlined in this paper:

- **Internet adoption.** Measure the breadth and equity of internet usage and ensure that all people have the devices, skills, and tools needed to reliably access basic human services, health care, economic development opportunities, and education.
- **Affordable technology.** Ensure access to affordable infrastructure by taking a technology-agnostic approach—lowering cost without sacrificing utility.
- **Sustainable financing.** Enable sustainable and affordable financing through blended finance models and multistakeholder partnerships.

The international community has a shared responsibility to close the digital divide as required by the SDGs. At this moment, when connectivity has never been more crucial, we must take a human-centered and technology-agnostic approach to connect the unconnected.

