

*A Market Landscape  
and Strategic Approach  
to Increasing Access  
to Digital Assistive  
Technology in Low- and  
Middle- Income Countries*



PRODUCT NARRATIVE:

# DIGITAL ASSISTIVE TECHNOLOGY



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GLOBAL PARTNERSHIP FOR  
ASSISTIVE TECHNOLOGY

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# EXECUTIVE SUMMARY

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**ASSISTIVE TECHNOLOGY (AT)** is an umbrella term covering the systems and services related to the delivery of assistive products such as wheelchairs, eyeglasses, hearing aids, prosthetic devices, and assistive digital devices and software. Today, over 1 billion people require AT to achieve their full potential, but 90% do not have access to the AT that they need.<sup>1</sup> Digital assistive technology (digital AT) is a broad category, but can be defined as assistive products that contain electronic information and communication technologies (ICT).<sup>2</sup> The digital AT ecosystem is made up of four interconnected components that are necessary for people to fully make use of the growing digital services and infrastructure, including: 1) accessible devices (e.g. mobile phones and tablets) and accessories (e.g. switches or braille readers); 2) accessible platforms or operating systems to enable consumption of what is on the device; 3) accessible software and applications that fulfil a particular purpose or user activity; and 4) accessible content, such as text, text-to-speech, native language availability and pictograms. The rate of adoption of the digital AT ecosystem is supported by four cross-cutting enablers: 1) awareness of digital AT and its accessibility by users, developers, suppliers, providers, and policymakers; 2) availability of mobile network and internet connectivity; 3) the application of universal design and inclusion of accessibility features; and 4) appropriate training in digital AT.

The digital AT areas described in this report represent different components of the digital AT ecosystem:

- Chapter (1) on mobile phones and **smartphones** is representative of the challenges and potential interventions related to **accessible devices** and **accessible platforms**.
- Chapters (2) and (3) on **screen readers** and **augmentative and alternative communication (AAC) devices** respectively highlight the challenges associated with **accessible software, applications,** and **accessible content**.

Individuals that require AT can benefit tremendously from the use of mobile phones, especially smartphones. Accessibility features and applications on a smartphone can provide similar assistance to many traditional assistive devices and/or augment digital assistive technologies. The use of digital AT enhances independence and productivity, improves access to the digital economy, and democratises access to information. However, penetration of mobile phones and telecommunication services is much lower in low- and middle-income countries (LMICs) than high-income countries (HICs).<sup>3</sup> Moreover, ownership among people with disabilities lags compared to the overall population. Barriers to mobile ownership and usage include, but are not limited to: the high cost of devices and network plans; limited awareness and understanding of the benefits of mobile phones as AT; limited disability-inclusive design; and limited use of tools that allow for the full use of mobile phones by persons with disabilities.<sup>4</sup> In order to increase access to mobile phones (particularly smartphones) as AT, there is a need to increase awareness and digital skills training, as well as to improve the affordability of mobile phones and data connectivity in LMICs.

<sup>1</sup> World Health Organization. Assistive technology. WHO; 2018. Available from: <https://www.who.int/news-room/fact-sheets/detail/assistive-technology>.

<sup>2</sup> Baner D, Hayes A, Kurz C, Kushalnagar R. Using information communications technologies (ICT) to implement universal design for learning (UDL). University Research Co; 2019. Available from: <https://www.urc-chs.com/sites/default/files/urc-grn-ict.pdf>.

<sup>3</sup> GSMA. The state of mobile internet connectivity. GSMA; 2019. Available from: <https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/07/GSMA-State-of-Mobile-Internet-Connectivity-Report-2019.pdf>.

<sup>4</sup> GSMA. Understanding the mobile disability gap. GSMA; 2019. Available from: [https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/12/GSMA\\_Understanding-the-mobile-disability-gap\\_116pg\\_Accessible.pdf](https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/12/GSMA_Understanding-the-mobile-disability-gap_116pg_Accessible.pdf).

Screen readers are software programmes for people with vision impairment and/or learning disabilities<sup>5</sup> that convert screen content into an accessible format for the individual, such as braille, speech, or both. Screen readers can be used on laptops, desktop computers, and mobile devices. Different models of screen readers exist: software built into the operating system; open source and free stand-alone software; and commercial paid subscription stand-alone software. Access to screen readers in LMICs is hindered by a number of barriers, including the following: low awareness of the existence and benefits of screen readers; limited availability of screen readers in local languages; lack of training; lack of accessible content; and unaffordable prices for commercial screen readers. In order to increase access to and usability of screen readers, it is proposed to support the development of text-to-speech synthesisers in local languages; establish (sub-)national programmes to enable price agreements with commercial screen reader suppliers; adopt accessibility standards on public government websites and apps; and increase awareness of and training for the use of screen readers.

Augmentative and alternative communication (AAC) is any type of method or system that is used to replace, or supplement, natural speech. There are generally two types of AAC: aided and unaided. Unaided AAC does not require external tools, while aided AAC does. Aided systems range from low-tech (paper-based) to high-tech (electronic) products. These products can be accessed through an array of motions such as: touch, mouse/mouse alternatives (e.g. joystick), eye gaze, and switches. Recently, smartphones and tablets have begun to replicate standalone AAC systems, allowing users to access free and open-source AAC software through the internet. Among many other benefits, AAC encourages independence, increases people's ability to participate in society, and reduces the financial burden for individuals and caregivers. Furthermore, providing AAC to younger children can prevent learning delays, strengthen understanding of language and future communication ability, and allow for wider integration in school. However, access to AAC in LMICs is often much lower than in HICs. Barriers to accessing AAC include, but are not limited to: low awareness of the benefits and effective provision of AAC, limited availability of appropriate products, and lack of funding. In order to increase access to AAC, it is proposed to ensure clear global guidance for appropriate and effective AAC provision in LMICs; expand AAC access through government-level ownership of procurement, provision, and financing; test and validate AAC solutions for low-resource settings; and ensure the availability of free and effective AAC applications.

A common set of recommendations focused on improving access to the components and enablers of the digital AT ecosystem emerge from the individual product landscapes included in this document. These recommendations can be viewed as high priority areas for improving access to digital AT in LMICs. They include:

- **Develop and adopt policies**, including legislation, regulations, minimum product standards, and guidelines to support accessibility and uptake of digital AT at global and country levels.
- Support LMIC governments to **increase awareness** of digital AT by including digital AT products, such as smartphones and AAC devices, on national assistive product lists.
- Support innovating financing schemes or negotiate pricing agreements to **reduce the cost** of digital AT to end users.
- **Increase availability of training** programmes for users, suppliers, and service providers on the importance of digital AT and digital literacy skills.

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<sup>5</sup> UNESCO. Global report: opening new avenues for empowerment. UNESCO; 2013.