Policy Brief on Assistive Technology (AT) and Employment*

Acknowledgments

The brief was authored by Melissa Miller (consultant), with contributions from Stefan Trömel (GEDI, International Labour Organization), Ranjavati Banerji, Kinley Wangmo, Satish Mishra and Karen Reyes Castro (ATscale). Special thanks go to the following individuals who shared their knowledge, expertise and resources: Fernando Botelho (UNICEF), Simon Brown (Economic and Social Inclusion Consultant), David Curtis (PAfID), Kheng Virak (PAfID), Jurgen Menze (International Labour Organization), Vicki Austin (Global Disability Innovation Hub), Rejaul Siddique (International Disability Alliance), Emma Tebbutt (World Health Organization), Edward Winter (World Vision), Marketa Smitova (Global Disability Innovation Hub), Celine Trublin (Humanity and Inclusion), Ritubhan Gautam (Clinton Health Access Initiative), Frederic Seghers (Clinton Health Access Initiative), Shashaank Awasthi (V-Shesh), Betty Najjemba (African Disability Forum), Tigmanshu Bhatnagar (Global Disability Innovation Hub), Shivani Gupta (Global Disability Innovation Hub), Bernard Chira (AT4D), Rasak Adekoya (Sightsavers), Tabie Kioko (Safaricom), Brendan Roach (PurpleSpace), Susan Scott-Parker (Scott-Parker International), Nasser Siabi (Microlink), Neil Milliken (ATOS), Neil Eustice (KPMG), Christopher Patnoe (Google), Andy Garrett (GSK), Shona McDonald (Shonaquip), John Wambua (United Disabled Persons of Kenya), Moses Chege (Sightsavers and Kenyan Business and Disability Network), Aziza Ahmed and Nayem Molla (Bangladeshi Business and Disability Network), Haibin Zhou (Easy Inclusion and Chinese Business and Disability Network), Yulieth Johana Garcia Alvarez (Comfama Colombia), Opeolu Stephen Akinola (Accesstech Research and Innovation Centre), Stephane Leblois (The Valuable 500), Manuel Rothe (CBM Global), Anneke Maarse (Light for the World), Lloyd Walker, Stuart Smith, Elizabeth Martin and Mary Hawkins (National Disability Insur-

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ATscale, the Global Partnership for Assistive Technology, is a cross-sector global partnership with a mission to transform people's lives through AT. It catalyses action to ensure that, by 2030, an additional 500 million people in low- and middle-income countries get the life-changing AT they need.

ILO, The International Labour Organization (ILO) is the United Nations agency for the world of work. We bring together governments, employers and workers to advance social justice and promote human-centred decent work through employment creation, rights at work, social protection and social dialogue. The ILO vision of a renewed social contract anchored in the Decent Work Agenda affirms social justice as the foundation of lasting peace, shared prosperity, equal opportunities and a just transition

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Executive Summary

Key Messages

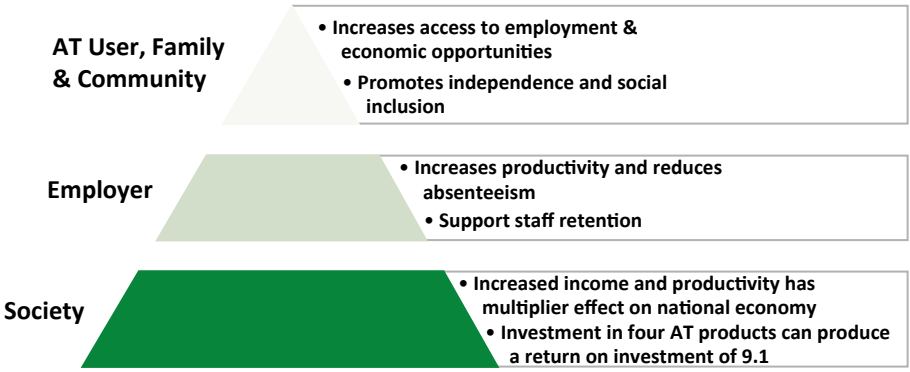
- Assistive technology (AT) acts as a critical enabler to overcome barriers to employment and has the potential to transform access to employment for persons with disabilities and other AT users.
- Despite the existence of policies in many low-and middle-income countries mandating reasonable workplace accommodations for employees with disabilities and AT users, the lack of funding mechanisms and coordinated AT infrastructure has prevented these policies from being effectively implemented.
- Significant barriers hinder access to AT for employment, including issues related to awareness, affordability, availability and usability, impacting both AT users and employers.
- Since the informal sector accounts for the majority of employment in most low- and middle-income countries, and since persons with disabilities are more likely than those without disabilities to work in the informal economy, it is imperative that policies and funding mechanisms address the AT needs of users across diverse employment contexts.
- Creation of enabling workplaces and a robust AT ecosystem for employment requires a multi-faceted approach where governments, employers, AT suppliers, organizations of persons with disabilities and other stakeholders work collaboratively to raise awareness, improve affordability and supply chains, promote inclusive policies, and invest in research and data.

Overview

This policy brief highlights the crucial role of Assistive Technology (AT) in expanding employment opportunities for persons with disabilities and other AT users in low- and middle-income countries (LMICs). AT enables users to perform job tasks, communicate with colleagues, navigate workplaces and participate in professional development opportunities. When combined with universal design principles, inclusive workplace policies

and a disability-confident culture, AT plays a key role in facilitating equitable access to employment. The cascading impact of providing AT for employment purposes extends beyond individual AT users, benefiting families, workplaces and society as a whole. By enhancing employment opportunities, productivity and social inclusion, AT has the potential to reduce poverty levels and reliance on unpaid support amongst AT users while also improving workforce retention, decreasing absenteeism, and contributing to economic growth and inclusive communities.

Despite the potential of Assistive Technology (AT) to enhance workplace accessibility, productivity and career advancement, only 5-15 per cent of those in need of AT in LMICs can access the assistive products they require, compared to 90 per cent in high-income countries. This disparity, coupled with educational and workplace barriers, limits employment opportunities for persons with disabilities, who face significant disability employment gaps globally. Barriers such as high costs, lack of awareness, inadequate policies around reasonable workplace adjustments and AT financing mechanisms, and supply chain limitations significantly hinder AT access, limiting employment opportunities and perpetuating socio-economic inequalities.



Infographic: Key benefits of the provision of AT for employment purposes

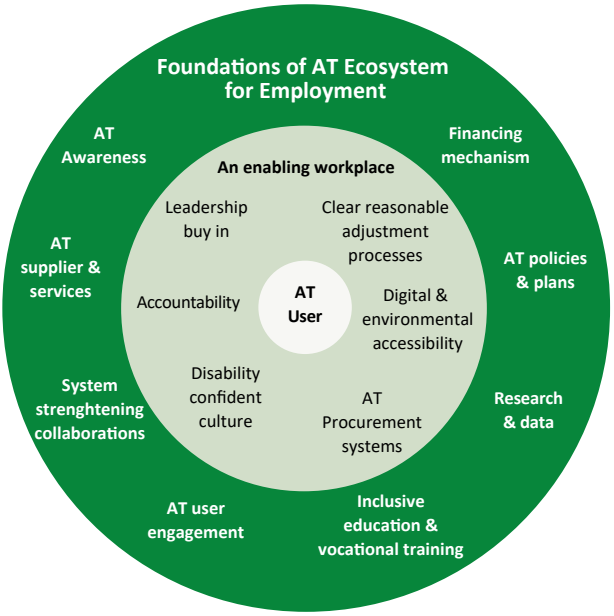
Addressing these challenges requires the integration of AT provision into employment policies, inclusive workplaces and systemic reforms to ensure affordability and availability of appropriate AT across diverse formal and informal employment sectors. Through advocacy, policy changes, and market development, some countries have made progress in expanding AT access, offering valuable insights for other LMICs that are working to bridge the disability employment gap.

While AT has traditionally been viewed through a medical and human rights lens, it must also be acknowledged as a socio-economic issue that affects individuals, their households and society as a whole.

This policy brief highlights the need for governments to prioritize investment in AT in order to improve employment opportunities and drive broader economic and social benefits.

Building the Foundations of an AT Ecosystem for Employment

Central to this policy brief is the understanding that better access to AT for employment purposes cannot be achieved by AT suppliers and employers alone; it requires the foundations of a robust ecosystem. A framework for developing an effective AT ecosystem is outlined, highlighting key areas and emerging practices to enhance affordability and accessibility to AT within the workplace.



Infographic: Constructing an enabling AT ecosystem with the AT user at the centre.

The policy brief also elaborates on specific actions that different stakeholders can take to strengthen the AT ecosystem with a focus on:

- Developing policy frameworks that promote the role of AT in reasonable workplace accommodations and that are accompanied by effective financing mechanisms.
- Supporting local AT innovation and production while building capacities of a workforce that can meet the need for local AT servicing and maintenance.

- Designating leadership at government level to drive national efforts around AT and employment, and at an employer level to oversee the implementation of inclusive policies and workplace adjustments.
- Building collaborations to strengthen global supply chains and address market barriers to accessing employment-related AT.
- Raising awareness among AT users, caregivers, employers, policy makers, community and industry leaders, and organizations of persons with disabilities of the potential of AT to improve employment outcomes, and disseminating information on the range of AT available to meet diverse needs in different employment contexts.
- Conducting research and gathering data to provide an evidence base concerning unmet needs and the impact of AT on employment outcomes.

1. Introduction

Globally, over a billion people live with some form of disability, with approximately 80 per cent residing in low and middle-income countries (LMICs)[1]. Assistive Technology (AT) plays a crucial role in bridging accessibility gaps, fostering social inclusion, and enabling access to employment for this group of people in addition to the many others who will rely on AT as they age.

However, access to AT remains inadequate, with only 5-15 per cent of those in need of AT in LMICs able to access these life-enhancing tools in contrast to 90 per cent in higher--income countries.[2] Alongside environmental, institutional, and attitudinal barriers, this inequity significantly limits opportunities for AT users in LMICs to access decent work.

The disability employment gap is a global issue: only one in three persons with disabilities is in employment and those that are working are more likely to earn less than people without disabilities.[3] The risk of exclusion from education, employment, or training is twice greater for young persons with disabilities than for young people without disabilities.[4] Employment is a cornerstone of socio-economic inclusion, yet individuals with AT needs, particularly persons with disabilities and those with chronic illnesses, face significant barriers to workforce participation, including less access to secondary school education,[5] negative perceptions of disability, inaccessible workplaces, limited access to skills training and a lack of access to reasonable workplace adjustments, which include modifications to the workplace environment and provision of AT.

In addition to addressing stigma and inaccessibility, AT is one part of the solution to tackling socio-economic disparities and underemployment among persons with disabilities and AT users. AT has the potential to enable its users to perform tasks, communicate, and navigate workplaces effectively. Lack of access to assistive tools and devices means that many persons with disabilities and other AT users struggle to attain and retain employment and to meet their full potential in their workplace. However, systemic challenges such as limited availability of affordable AT and insufficient support services continue to hinder access to AT, especially in LMICs. Integrating the provision of AT into employment policies and programmes is critical to fostering inclusive work environments and mitigating these barriers.

[1] WHO, World Report on Disability, 2011.

[2] WHO and UNICEF, Global Report on Assistive Technology, 2022.

[3] ILO, New ILO database highlights labour market challenges of persons with disabilities, 2022.

[4] Mastercard Foundation, Disability-Inclusive Employment: Understanding the Context, 2023.

[5] UNICEF Fact Sheet: Children with Disabilities, 2022.

This policy brief is a joint initiative by the ILO and ATscale to highlight the important role of AT in enhancing employment opportunities for persons with disabilities and other AT users in LMICs. The brief aims to improve understanding of the barriers that AT users and employers face in accessing AT for employment purposes and the impact of AT on accessibility, performance and career advancement. Evidence-based policy recommendations are put forward to support governments, employers, AT suppliers, organizations of persons with disabilities and other actors, all of whom have a vital role to play in strengthening the foundations of a robust AT ecosystem for employment.

1.1. Statement of the Problem

As part of its mission to promote access to decent work for persons with disabilities, the ILO recognizes the transformative potential of Assistive Technology (AT) to act as an enabler to overcome barriers to employment and foster more inclusive workplaces. However, several challenges hinder access to AT in the employment sector:

- High costs and limited funding for AT.
- Lack of awareness and training among employers and employees about how AT can act as a reasonable adjustment to address environmental, digital, communication and task-related barriers in the workplace. Similarly, a lack of awareness and training in educational institutions which prepare the future workforce.
- Insufficient policies and regulations that mandate reasonable adjustments in the workplace and highlight the provision of AT as a critical part of this process. Where these policies do exist, problems may still arise due to a lack of enforcement, inadequate support services to provide guidance on appropriate adjustments and failure of policies to address local availability and affordability. Moreover, a significant proportion of the workforce in LMICs are active in the informal sector, which usually lacks regulatory oversight.
- Supply-chain issues in LMICs limit access to appropriate AT.

In addition, the increasing digitization of recruitment and workplace systems presents new barriers, as many of the new systems are incompatible with assistive software or fail to meet accessibility standards, effectively excluding AT users from job opportunities.

This policy brief explores emerging areas of promising practice in the provision of AT for employment purposes. A strong disability movement, advocacy campaigns, policy reforms, and market shaping have enabled some countries to expand AT access within the labour market, offering valuable insights for other LMICs that are embarking on this journey to redress global imbalances in accessing AT for employment.

1.2. Methodology

In order to better understand the current context surrounding the provision of Assistive Technology (AT) in the labour market in LMICs, a comprehensive literature review was conducted of academic literature, grey literature, webinars, online portals and knowledge platforms alongside a review of existing policies relating to non-discrimination in employment and workplace adjustments. The desk review was complemented by extensive consultations with 65 people representing a cross section of stakeholders, including: AT users, AT developers and suppliers, policy makers, development partners, multinational companies, national companies, employment services, organizations of persons with disabilities, business disability networks, workplace adjustment services and mainstream technology providers.

2. Assistive Technology and Employment

Assistive technology plays a foundational role in making workplaces accessible in the first place and provides AT users with tools to increase their employability options. It enhances the functional abilities of individuals by addressing barriers to accessing the workplace and engaging in work tasks, subsequently supporting AT users to seek, secure, and retain meaningful employment.

AT includes: physical products such as prostheses, orthoses, wheelchairs, spectacles, and hearing aids; digital tools such as software and apps that support planning and communication; or environmental adaptations such as ramps, hoists and grab rails. Within workplaces, AT may also include tools and equipment that are adapted to enable a person to perform a specific task or tasks, whether in an office environment, a factory, an agricultural setting or any other workplace.

The functional abilities in the specific context of this policy brief relate to an individual's capacity to find and retain work, and also to progress within their chosen profession, by enabling them to:

- Perform job tasks that would otherwise be difficult or impossible
- Communicate and collaborate effectively with colleagues
- Access and navigate the physical work environment
- Participate in training and professional development opportunities
- Manage time, tasks, and workflow
- Access information in alternative formats.

What is Assistive Technology and who uses it?

Assistive technology (AT) is an umbrella term for assistive products such as wheelchairs, hearing aids, prostheses, eyeglasses or digital devices, and their related systems and services. AT can facilitate people's ability to move, communicate, and see better than before.

Alongside universal inclusive design principles,[6] inclusive work policies and a disability inclusive ethos, AT is a crucial enabler that can support more people with functional impairments to access work. In the context of ageing populations, increasing prevalence of noncommunicable diseases, and evolving work modalities (such as remote and hybrid work), AT is increasingly vital for sustaining employment across the life course. AT also helps prevent people from being forced out of the workforce prematurely.

This policy brief acknowledges the challenges in distinguishing between AT used by people to meet daily functional needs in their homes and communities and that which is required for work purposes. It is particularly difficult to make the distinction in LMICs where so many people do not have access to the AT they need for essential daily functioning. Globally, less than 10 per cent of people who require hearing aids have access to them[7] and only 5-35 per cent of those needing wheelchairs report having their need met,[8] with those in LMICs most at risk of having unmet needs. The absence of structured systems for provision of AT exacerbates inequalities and the lack of reasonable adjustment processes in workplaces limits employment opportunities for AT users in LMICs.

3. Frequently Used Assistive Technology for Employment

The type of AT required will vary across different employment contexts and will be tailored to the needs of AT users, specific work tasks and the work environment. AT is not a one-size-fits-all solution: it must be personalized, context-specific, and aligned with the preferences of the user.

It is important to note that new technology is rapidly expanding the range of AT available and people with similar needs may not necessarily choose the same solution. How-

[6] Universal Design involves creating environments, products, and services that are accessible, understandable, and usable by people of all ages, sizes, abilities, and disabilities. By addressing diverse needs throughout the design process, universal design ensures spaces and systems are not only functional but also enjoyable and inclusive for everyone. Source: Centre for Excellence in Universal Design.

[7] WHO, Assistive Technology Fact Sheet, 2 January 202

[8] WHO, Wheelchair Provision Guidelines, 2023.

ever, the list below offers a non-exhaustive overview of commonly used AT categories in employment settings. These examples are illustrative (not prescriptive) and aim to showcase the diversity of AT technologies available for use in the workplace.

Please note that this list does not include everyday assistive items commonly in use, such as wheelchairs, hearing aids, white canes, walking sticks, orthotic supports, and prosthetic limbs.

SOFTWARE	HARDWARE
• Speech recognition software • Text-to-speech readers • Speech-to-text software • Goal-setting apps • Task-management apps • Mood-regulating apps • Closed captioning • Eye-gaze-control software • Travel aids including wayfinding apps • Note-taking apps • Mind-mapping software • Grammar software • Braille translators • Image description software • Screen magnifier software	• Large screens • Screen magnifiers • Adaptive keyboards and mice • Joysticks • Switch buttons • Headsets and sound amplification systems • Communication boards • Smartphones and tablets
FURNITURE	**FURNITURE**
• Ergonomic chairs and desks • Ergonomic aids such as footrests, monitor arms and raisers, anti-fatigue mats and arm supports • Pressure-relief cushions	• Standing frames • Grab rails • Hoists • Ramps

Many of the AT products listed above are particularly relevant to office workplaces and it is important to recognize that various other forms of AT are used in other sectors. New developments in artificial intelligence and in-built accessibility features in smartphones are transforming AT markets and offering greater access to more affordable AT solutions. Innovative adaptation of tools and equipment is also increasing access to employment for people with AT needs in agricultural and manufacturing contexts. Ultimately, ensuring access to AT in the workplace is not about prescribing a fixed set of tools, but about creating flexible, inclusive environments that empower individuals to work with dignity, autonomy, and full participation.

Assistive Technology innovations in the Agriculture Sector

The Agri-Lab model uses a Human-Centred Design approach to create a space for participatory innovation where farmers with disabilities co-design accessible agricultural tools, equipment, and work processes alongside technical experts and create AT solutions that are adapted to their specific contexts. This subsequently increases access to agricultural livelihood opportunities for more persons with disabilities.

Initially developed by Light for the World, the model has now been scaled and integrated into local agricultural planning more widely, and recognized for its impact inclusive rural development. Agri-Labs are a key component of the SPARK programme led by Light for the World, ILO and Procasur to support IFAD in advancing Disability Inclusive Rural Transformation in Burkina Faso, India, Mozambique, and Malawi. There is potential for this model to be scaled further to encourage the development of simple, cost-effective designs using locally sourced materials.

3.1. Artificial Intelligence as Assistive Technology

Artificial Intelligence (AI) offers significant potential to improve access to employment for AT users and is filling gaps in the AT market to support communication, transport, productivity and social inclusion in the workforce. AI applications are increasingly used as a form of reasonable adjustment within employment to:

- **Support the job search process.** AI can streamline job application processes and assist with formatting written text.
- **Prepare candidates for the interview process.** Career Interview Readiness in Virtual Reality (CIRVR) is a VR and AI-powered coaching system for job interviews that uses avatars, cameras, microphones, and sensors to help people with autism prepare for interviews by simulating open-ended questions and potential distractions.[9]
- **Enhance digital accessibility** through generating closed captions, alt text, speech-to-text transcription and visual descriptions. Eye-gaze-control systems enable users to control their computer via eye tracking, voice-command applications can facilitate control of the work environment as well as other tools and equipment and non-standard voice solutions exist to enable people with atypical speech patterns to use voice command technology. AI tools are being used to produce closed captioning for deaf users and audio descriptions of objects and people for individuals with visual impairments whilst wayfinding apps support people with visual impairments to navigate workplaces.

[9] Adiani, D., et al., Multimodal job interview simulator for training of autistic individuals, Assistive Technology, April 2023.

- **Improve productivity** by providing literacy support, predictive text, planning and mind-mapping tools. AI platforms can break down information in ways that can be adapted to meet the user's needs.
- **Create more interactive ways of delivering training** through augmented reality.
- **Facilitate the commute to work.** AI-powered smart wheelchairs and self-driving cars can increase autonomy and independence and address the barriers that many persons with disabilities face in commuting to work.

However, alongside these opportunities, several risks need to be addressed in order to ensure equitable outcomes and avoid perpetuating further discrimination against persons with disabilities. There are concerns that, if AI screening tools are trained on historical data that replicates past hiring patterns, the tools may exclude persons with disabilities by overlooking candidates who differ from employees who were hired previously.[10,11]

Care needs to be taken to mitigate against any potential bias during the development and testing stage of AI tools, by ensuring that data sets and algorithms used to train AI are inclusive and account for the diversity of persons with disabilities. Many AI- driven tools, apps, and interfaces may not be designed with inclusive practices in mind, creating new barriers rather than removing them. For example, facial recognition tools may struggle to identify individuals with atypical facial features or expressions. Data privacy is also a concern as there is a risk that sensitive personal data collected by AI tools, such as data related to health and behaviour, could be misused if not properly secured.[12] To address these risks, it is crucial to use diverse data sets, apply universal design principles, consult with persons with disabilities during the design, testing, and evaluation phases, adopt ethical standards and audit processes[13] that enable early identification of bias, and embed robust data protection measures and inclusive design principles from the outset.

Sharing Assistive Technology solutions through AI

DISH (Disabilities Innovative Solutions Hub) is an AI-powered platform developed by EnAble India in collaboration with the Zero Project to connect persons with disabilities and stakeholders to assistive solutions, including products, processes, and programmes. By using AI and integrating data from a wide range of sources, DISH enables users to search,

[10] European Disability Forum, Artificial Intelligence, inclusive education and employment: opportunities and challenges, 2023.

[11] Scott-Parker, S., AI Powered Unfair Recruitment, 2023.

[12] Bossewitch, J., et al., Digital Futures in Mind: Reflecting on Technological Experiments in Mental Health & Crisis Support (University of Melbourne, 2022).

[13] Employer Assistance and Resource Network on Disability Inclusion (EARN), Use of Artificial Intelligence to Facilitate Employment Opportunities for Persons with Disabilities, 2023.

develop, and replicate emerging solutions to a specific question via both WhatsApp and a platform-based interface, making it easily accessible in multiple languages. The platform helps bridge knowledge gaps regarding AT by making AT solutions discoverable and scalable while offering free access to essential information and resources.

3.2. Mobile Technology as Assistive Technology

Mobile phones, other smart devices and access to the internet are frequently cited as the technologies that do most to advance the independence and the social and economic inclusion of persons with disabilities. Several research studies explore how mobile technology is being used as AT in LMICs and how smartphones can be more accessible, affordable, and effective for persons with disabilities.[14,15]

In a study on the impact of mobile phones on the lives of persons with disabilities in Kenya and Bangladesh, it was found that mobile phones play a crucial role in supporting the livelihoods of persons with disabilities by enabling financial transactions, business management, and communication with customers. From facilitating small business operations to securing loans, mobile connectivity allows individuals to work more efficiently, access essential services and engage in economic and social activities that would otherwise present difficulties due to mobility or communication barriers.[16]

ATscale, in partnership with Google and the Global Disability Innovation (GDI) Hub, jointly funded a research project to assess the feasibility and impact of providing mobile phones as AT solutions for persons with disabilities in LMICs, with a specific focus on individuals with visual and hearing impairments in Kenya, India, and Brazil. The study explored the potential of Android smartphones as effective AT for individuals with visual and hearing impairments. Preliminary findings indicate that smartphones, when paired with digital literacy and reliable internet access, can serve as powerful, multifunctional assistive products for persons with disabilities.[17]

For individuals with visual impairments, smartphones can partially substitute traditional assistive technologies such as braille readers and standalone screen readers. Built-

[14] International Telecommunications Union, The ICT Opportunity for a Disability-inclusive Development framework, 2013.

[15] Raja, D.S., Bridging the Disability Divide through Digital Technologies World Bank Group, 2016.

[16] Jahan, N., et al., Inclusion and Independence: The impact of Mobile Technology on the Lives of Persons with Disabilities in Kenya and Bangladesh, in: 2020 IEEE Global Humanitarian Technology Conference. IEEE: Seattle, WA, USA.

[17] The Centre for Accessibility in the Global South, IIIT Bangalore, Global Disability Innovation Hub, UCL, Android Phones as Assistive Technology, 2025.

in tools like TalkBack, Google Assistant, and Lookout offer key functionalities to support visual navigation and access to information. For individuals with hearing impairments, smartphones can also serve as partial substitutes for hearing aids in certain cases. Features such as Sound Notifications, Live Transcribe, and Live Captions provide real-time support and accessibility. These applications can effectively complement national sign languages and other tools designed to enhance sign language communication. However, many of the accessibility features offered by mobile phones remain unused due to lack of digital skills or lack of awareness among users.[18]

Digital skills training is essential for enabling people to maximise the potential of smartphones as AT and to make use of all of the features that smartphones offer for supporting access to employment, such as text-to-speech, speech-to-text, magnifiers, eye gaze control and wayfinding and navigation apps for people with visual impairments. Addressing this digital divide is essential for ensuring equitable access to employment and broader social participation. Smartphones present a much more affordable and accessible option than bespoke AT and are particularly valuable for micro-entrepreneurs. When combined with inclusive digital ecosystems and capacity building, mobile technology can serve as a powerful equalizer, supporting autonomy, productivity, and meaningful economic participation.

4. Benefits of Assistive Technology

The benefits of AT across the life course have a cascading effect that extends beyond the AT user to their family and local community, their employer or workplace and to society at large. Access to AT enhances employment opportunities, productivity, and social inclusion for individuals while contributing to reducing poverty and reliance on unpaid support.

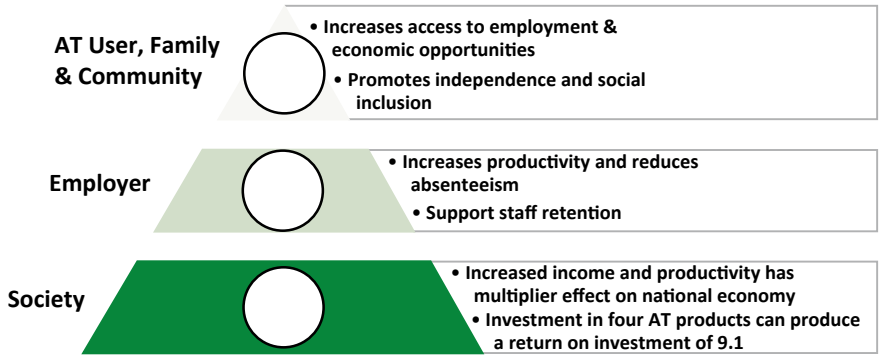
AT has the potential to improve workforce retention, reduce absenteeism, boost economic growth and foster more inclusive, sustainable communities

Assistive Technology generating job creation

NeoMotion enhances employment opportunities for persons with disabilities in India through its customized wheelchairs and motorized add-ons that transform wheelchairs

[18] Barbareschi, G., et al., Bridging the Divide: Exploring the use of digital and physical technology to aid mobility impaired people living in an informal settlement. In The 22nd International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '20), October 26–28, 2020, Virtual Event, Greece. ACM, New York, NY, USA.

into vehicles, enabling users to work as delivery drivers. NeoMotion have partnered with Zomato, a food delivery company, to establish the Livelihood on Wheels initiative, which trains persons with disabilities in digital skills, financial literacy, and app navigation to support their work in food delivery across 30 cities in India. The initiative has generated nearly $400,000 in income for 500 delivery partners with a goal of expanding to 1000 participants in 2025.



Infographic: Key benefits of the provision of AT for employment purposes

Beyond food delivery services, NeoMotion products have been used in diverse jobs, including supervision of farming work in rural areas, lottery sales, mail delivery and milk distribution, demonstrating the transformative impact of mobility solutions on economic independence. The motorized wheelchair also provides a solution for overcoming inaccessible transport systems and enabling people with physical disabilities to commute to work.

4.1. Individual/Household and Community Benefits of Assistive Technology

- Enhances access to work opportunities by enabling AT users to perform tasks that may have been challenging without appropriate AT.
- Enables AT users to overcome barriers to finding out about and applying for job opportunities, commuting to interviews and workplaces, and progressing and engaging in professional development opportunities.
- Facilitates social inclusion in the workplace.
- Based on investment in four AT products (hearing aids, prostheses, eyeglasses, and wheelchairs), research reveals that access to AT can impact lifetime earning potential in LMICs yielding about US$100,000 in average increased income across

the lifetime of a child who receives AT[19] by enhancing access to education and employment.

- Boosts individual productivity, allowing users to earn more in their job. ATscale estimates that access to the four focus products can increase an AT user's productivity by average 16 per cent.[20]
- Increase in the income of individuals can help offset some of the other additional costs associated with disability, such as higher healthcare and transport costs, and can contribute towards breaking the cycle of poverty and disability.
- Enables users to have a longer working life by mitigating some of the challenges associated with ageing and by improving health outcomes. An ongoing source of income is vital in countries that have limited social protection systems in place for older people.
- Gives AT users more choice as to their career path.
- The push towards more localized production models for AT can also present employment opportunities for AT users in this growing market at design, production and maintenance stages as more attention is focused on the sustainability of AT provision models. Research into localized production models explores whether a circular model of production, placing end users closer to the AT value chain, could be a more sustainable approach.[21]
- Meeting the unmet need for AT can generate nearly US$2 trillion in additional family income by creating time for family caregivers to engage in paid work.[22]By enabling users to perform more daily tasks independently and to engage in employment, AT reduces reliance on unpaid family support – particularly support from women and girls – allowing them to pursue education and employment opportunities.
- Research in India on the correlation between access to AT and employment found that the provision of AT significantly increases labour force participation among persons with disabilities, with a 26.6 per cent increase overall and an 86.7 per cent rise in urban areas. However, the same research found that accessing appropriate AT remains a challenge, and that improvement of literacy, vocational skills, and infrastructure are also crucial enablers for enhancing the employment opportunities of people with disabilities.[23]

[19] Tscale, The Case for Investing in Assistive Technology, 2020.

[20] ATscale, The Case for Investing in Assistive Technology, 2020.

[21] Oldfrey, B. et al., More Environmentally Sustainable Models of Product Design, Manufacture and Service in a Post-COVID World?, Sustainability, 2021, 13(19), 10867.

[22] ATscale, The Case for Investing in Assistive Technolog, 2020

[23] Rajasulochana, S.R. et al., Does access to assistive technologies enhance labour force participation amongst the disabled population? Evidence from India, International Journal of Manpower, July 2024.

4.2. Employer-level Benefits of Assistive Technology

- Use of Assistive Technology (AT) reduces turnover and absenteeism. A Microlink survey of 3000 employees found that both line managers and employers who had received workplace adjustments (including provision of AT) reported increases in productivity as well as a significant drop in absenteeism in the 12 months following a workplace adjustment.[24]
- Implementing processes to provide AT helps to create a supportive and enabling workplace for all existing staff (with and without disabilities).
- Use of AT positions organizations/employers as an attractive workplace for a diverse talent pool, enhancing reputation and competitiveness.
- In countries where quotas exist for hiring persons with disabilities, the provision of AT supports companies to meet these quotas in a meaningful and sustainable way.
- Normalizing the presence and use of AT in the workplace enhances employee engagement and psychological safety, improves team morale and reduces stigma. It also helps to mitigate risks associated with non-compliance with employment laws.
- AT supports the retainment of qualified staff. The cost of doing nothing can be higher than the cost of providing AT if experienced staff members leave a company because they cannot access AT, making it necessary to hire and train new staff members.
- Research by Accenture analysing disability inclusion practices and financial performance across 140 companies in the United States found that companies which prioritize disability inclusion outperform peers, achieving 28 per cent higher revenue, double net income, and 30 per cent higher economic profit margins.[25] The provision of AT is one of the key enabling factors that the report highlights as crucial for building an inclusive workplace.

4.3. Society-level Benefits of Assistive Technology

- The economic benefits of providing AT extend beyond individual users through a multiplier effect. Higher employment and productivity among AT users lead to greater household incomes, increased tax revenues and stronger community spending, generating a virtuous cycle of sustained national economic growth.
- Research by ATscale shows that provision of AT to everybody who needs it worldwide would generate more than US$10 trillion in economic benefits over the next 55 years.[26] The Accenture report states that, in the US, if only 1 per cent more persons with disabilities joined the workforce, US GDP could increase by up to US$25 billion.[27]

[24] Microlink, Workforce Presentation, 2016.

[25] Accenture, Getting to Equal: The Disability Inclusion Advantage, 2018.

[26] ATscale, The Case for Investing in Assistive Technology, 2020.

[27] Accenture, Getting to Equal: The Disability Inclusion Advantage, 2018.

- Investment in four AT products (hearing aids, prostheses, eyeglasses, and wheelchairs) can produce a return on investment of 9:1.[28]
- Ability of AT users to access work and lead more independent and healthy lives reduces their reliance on social welfare and healthcare systems.
- Further interest in AT stimulates market demand for AT products and services and can contribute to increased job creation in the AT sector itself and its broader supply chain.
- Use of AT contributes to more inclusive societies where everyone is enabled to participate and contribute to their full potential across the life course.

4.4. An Enabling Environment is Crucial

It is important to understand that the benefits of AT, which have been described above, cannot be achieved simply by the provision of AT. In order for AT to be used effectively, it needs to be complemented by several other factors: accessible digital and physical environments that apply universal design principles, a disability-inclusive workplace, and training in digital skills.

Socio-economic impact of eyeglass provision

The largest recorded impact of an AT intervention on productivity and income is seen in two studies related to the provision of affordable reading glasses.[29,30] The gains are particularly notable among women, who constitute a large portion of the workforce in industries like tea picking and garment manufacturing. Correcting near-vision impairment allows individuals to work longer, improve product quality, and return to work after periods of inactivity.

A randomized control trial in Assam, India, found that providing US$1.80 reading glasses to ageing tea pickers increased their productivity by 22 per cent, with those aged over 50 seeing a 32 per cent boost. The study highlighted the economic and social benefits of improved vision, where increased production leads to higher earnings, reducing household and community poverty levels and positively impacting the health and well-being of family members.[31]

The THRIVE study in rural Bangladesh revealed that provision of reading glasses increased earnings by 33 per cent, helping economically inactive individuals to return to work and improving overall quality of life. Study participants included workers in agricul-

[28] ATscale, The Case for Investing in Assistive Technology, 2020.

[29] BRAC, New report: Reading glasses boost income by a third in low-income communities, 2024.

[30] Orbis, Glasses study shows huge productivity boost for workers, 2018.

[31] Orbis, Glasses study shows huge productivity boost for workers, 2018.

ture, artisan crafts, teachers, tailors, shopkeepers, and mechanics. With 50 per cent of people aged 35-65 experiencing presbyopia, the study demonstrates the vast economic potential of affordable vision correction.[32]A further study by Orbis found that unaddressed near-vision impairment among female garment workers in Bangladesh is linked to lower monthly salaries, with over 20 per cent of women aged 30-35 already affected despite being in their prime working years and those living in rural areas being particularly impacted. Provision of affordable glasses could boost earnings by US$70 per year, benefiting both workers and factory productivity while helping to lift more women out of poverty.[33]The research suggests that investing in accessible eye care represents a cost-effective strategy for poverty reduction and economic development in these regions.

5. Barriers to Accessing Assistive Technology in Employment

Key barriers that hinder access to AT include issues related to awareness, affordability, availability, and usability.

Even when employers have the will to support access to AT as part of a reasonable adjustment process, they encounter a number of systemic challenges involving policy, funding, and coordination that limit their ability to provide AT.

At an intersectional level, these barriers are amplified for women, people in rural areas, and underrepresented groups of persons with disabilities who have faced greater challenges accessing education and, subsequently, employment opportunities.

5.1. Barriers for Assistive Technology Users

- **Lack of Awareness and Information:** Many people, including potential AT users, employers, and government officials, are not aware of the AT, which is available, or of the potential benefits of AT in improving employment outcomes. Such lack of awareness is more prevalent in rural areas. There is also limited awareness within vocational colleges of how equipment can be adapted to enable an AT user to engage more effectively in some vocations. This is further amplified by inadequate exposure of children and young people to AT in education settings. Many people do not know where to look for advice on AT for want of a consolidated information platform to share solutions.

[32] Sehrin, F. (2024) The effect on income of providing near vision correction to workers in Bangladesh: The THRIVE (Tradespeople and Hand-workers Rural Initiative for a Vision-enhanced Economy) randomized controlled trial, PLoS ONE 19(4): e0296115, 2024

[33] Orbis, Better Eye Care Could Boost Female Garment Workers' Pay, 2022.

- **Affordability:** The cost of AT, driven by factors such as importation, taxes, and distribution, makes it unaffordable for many, especially in LMICs where persons with disabilities face greater challenges accessing paid employment. Those living in rural areas are further disadvantaged as availability of products is often limited to urban locations and the cost of travelling to a city is in itself prohibitive.
- **Lack of Maintenance, Repair, and Support Services:** Even when individuals are able to access AT, the absence of reliable maintenance and technical support services can significantly undermine its sustained use. Breakdowns or malfunctions without access to local repair services, spare parts, or trained technicians can lead to long periods without functional AT, jeopardizing employment continuity.
- **Digital Access and Skills:** Many persons with disabilities remain digitally excluded due to inaccessible websites and unaffordable technology. A lack of digital skills required by employers further reduces employment opportunities even if accessible systems are in place.
- **Systemic and Attitudinal Barriers:** Social prejudices and stigma also deter individuals from using AT. A recent survey of AT users found stigma to be the second largest barrier to their use of AT.[34] Some employees are concerned about negative reactions from supervisors if they request workplace accommodations.[35] Even when a workplace adjustment process is in place, persons with disabilities may fear that they will not be hired if they disclose their disability or request AT at the recruitment stage. A Deloitte study across 20 countries found that workplace accommodations that are highly specific and tailored to individual needs, such as assistive technologies, tend to have the highest rejection rates. For example, alternative communication methods were requested by 30 per cent of respondents but rejected in 63 per cent of cases and assistive software solutions had a 27 per cent request rate, yet 63 per cent were denied.[36] Cost and implementation challenges were cited as significant factors in the rejection of accommodation requests.
- **Inequity in access:** Huge inequalities play out between persons with disabilities who have been able to access an education and who are therefore more likely to obtain roles in larger companies with systems in place to provide AT, on the one hand, and persons with disabilities who work in the informal sector, on the other hand. Research shows that women with disabilities are doubly disadvantaged when it comes to accessing AT for employment purposes as they face poorer employment and livelihood outcomes[37] due to lower levels of education, stigma and reduced opportunities to

[34] IDA & GDI Hub, Navigating the AT Ecosystem as Users: Findings from IDA's Assistive Technology Survey, 2024.

[35] Deloitte, Disability Inclusion @ Work 2024: A Global Outlook, 2024.

[36] Deloitte, Disability Inclusion @ Work 2024: A Global Outlook, 2024.

[37] Bechange, S., et al., Livelihood outcomes in a cohort of youth with disabilities following participation in an economic empowerment programme in rural Uganda, Disability and Health Journal, Volume 14, Issue 3, 2021.

access work. They are also more likely to have unmet AT needs, compared to men with disabilities.[38] Women with disabilities who lack access to AT are more likely to be excluded from the workforce than other women.[39]

Inequities accessing Mobile (Smartphone) Technology

Smartphone ownership is more widespread in high-income countries than in low-income countries, so persons with disabilities living in the latter countries are less likely to benefit from the accessibility features (screen readers, magnification, text-to-speech, customizable display settings, etc.) that enable smartphones to be used as a form of AT. Also, younger people under the age of 35 have greater access to such accessibility features as they have a higher likelihood of owning smartphones.[40] Women in LMICs are less likely to have access to smartphones, particularly women with disabilities, those living in rural areas and women with low levels of literacy.[41] Research in Kenya and Bangladesh revealed a significant gap in access, ownership, and usage of mobile phones between people with and without disabilities, since affordability issues and lack of awareness of accessibility features limit the value of mobile phones as assistive technologies. The same research found that 70 per cent of persons with disabilities who do own mobile phones have basic phone models, which lack many or all of the accessibility features of smartphones.[42]

5.2. Barriers for Employers

- **Digital Inaccessibility:** A digital divide exists that excludes many AT users from accessing communication, services and information. The divide is exacerbated by the many public and private sector platforms, which do not fully comply with accessibility standards and therefore are not compatible with AT products such as screen readers, and this problem is made acute by under-provision of suitable platforms by employers. One of the most significant barriers facing people with visual impairments in workplaces is the lack of universal design in many administrative software solutions such as online job-application platforms or CRM systems, limiting accessibility and the

[38] de Witte, L., et al., Inequities in access to assistive technology: a call for action, The Lancet Public Health, Volume 10, Issue 1, e4 - e5, 2025.

[39] ATscale, The Case for Investing in Assistive Technology, 2020

[40] Silver, L., Smartphone Ownership Is Growing Rapidly Around the World, but Not Always Equally, Feb 5 2019, Pew Research Centre.

[41] GSMA, The Mobile Gender Gap Report, 2023.

[42] GSMA, Understanding the mobile disability gap: Summary of findings from fieldwork in Kenya and Bangladesh, 2019.

ability to access a system independently. This is partly due to a lack of regulation and insufficient involvement of people with impairments in the design process.[43]

- **Lack of Inclusive Hiring Practices and Disclosure Support:** Recruitment processes often do not encourage or accommodate disclosure of AT needs. Fear of discrimination discourages AT users from self-identifying as requiring AT, especially when job descriptions, interviews, and onboarding lack inclusive protocols.
- **Lack of Knowledge and Training for Employers and HR Teams:** Many employers, including HR professionals and line managers, lack practical training or technical guidance on how to facilitate selection of appropriate AT and to support its use in the workplace. This leads to underuse or poor implementation of AT even when policies exist.
- **Inadequate Workplace Infrastructure:** Workplace infrastructure is not always designed to accommodate AT users, and many employers lack awareness of how to integrate AT solutions effectively.
- **Financial Constraints:** AT is often viewed as a costly adjustment. Additionally, a lack of government incentives and supportive policies can discourage employers from investing in AT-friendly work environments.
- **Procurement Processes:** Cumbersome procurement processes at large employers may discourage them from buying small batches of specialized AT. Large organizations need proper governance and supply chain compliance, which can be expensive, making it difficult for them to deal with specialist or small companies selling AT. It can also take several months of negotiations and planning to bring a product that does not exist locally into a country.
- **Compliance and Security Concerns:** Employers may be hesitant to introduce new AT software due to concerns about ICT security and data protection requirements. New software integration requires thorough compliance checks. While compliance can be expensive for small and medium sized entreprises (SMEs), they often have greater flexibility and fewer bureaucratic hurdles compared with larger companies, allowing them to adapt more quickly to meet the AT needs of employees with disabilities.

5.3. Barriers within the Assistive Technology Ecosystem

- **Availability and Supply Chain Issues:** In a global survey of AT users, only 17 per cent of respondents felt they had access to a good supply of AT.[44] Many LMICs lack domestic or regional manufacturers and suppliers of certain AT products. This results in a reliance on expensive imports and limited availability of a number of appropriate products.

[43] Halbach, T., et al., The Role of Technology for the Inclusion of People with Visual Impairments in the Workforce. In: Antona, M., Stephanidis, C. (eds) Universal Access in Human-Computer Interaction. User and Context Diversity. HCII 2022. Lecture Notes in Computer Science, vol 13309. Springer, Cham. 2022.

[44] IDA & GDI Hub, Navigating the AT Ecosystem as Users: Findings from IDA's Assistive Technology Survey, 2024.

- **Usability and Appropriateness:** Donated AT may not be not tailored to an individual's needs and may do more harm than good in some cases. AT devices and programmes are often abandoned because they are not properly suited to the individual or to the tasks that the individual needs to perform. Additionally, many assistive technologies are designed and developed in high-income countries without considering the context and needs of users in LMICs.
- **Lack of Expertise and Support:** Low workforce capacity in AT maintenance and repair services affects the usability of AT as does the inadequate number of professionals with expertise in conducting assessments and providing advice on AT that is suitable for use in workplaces.
- **Provision of AT is often fragmented:** There is often a lack of coordination between those delivering AT[45] (NGOs, faith-based organizations and state-run structures across different sectors including employment, health and humanitarian response). This results in fragmented procurement systems and a lack of clear responsibilities within government departments.
- **Inconsistent Standards and Regulations:** The absence of national specifications, standards, or supply chain infrastructure for assistive products can lead to the provision of poor-quality products.
- **Inadequate Integration in Livelihood Planning:** Many NGOs running livelihood programmes recognize that AT is needed but do not have a specific policy for its sourcing or, when AT has been provided, they are unable to find local support for maintenance and repairs.
- **Inadequate Political Will:** AT is often not a priority for governments due to competing issues. When AT is considered, discussions are often focused on rehabilitation rather than workplace inclusion. A lack of consistent political commitment and inadequate funding and resources hinder access to AT.
- **Policy Challenges:** Insufficient policies and guidance on AT as a workplace adjustment can hinder the integration of AT, and policies mandating reasonable accommodations are often poorly enforced.
- **Limited Research, Data, and Evidence on AT and Employment:** There is a lack of disaggregated data on the employment outcomes of AT users, which limits evidence-based policymaking, programme design, and investment decisions. Most AT related data remain siloed in the health or education sectors.

[45] CHAI, Catalysing AT access: Scaling rehabilitative services and increasing access to AT in Kenya, 2021.