Microsoft

Bridging the Disability Divide

Reflecting on 5 years of the AI for Accessibility program

Microsoft is committed to technology that advances equity for people with disabilities. Together with our partners, we are working to create a more accessible and inclusive world.

At Microsoft, we strive to raise the bar on accessible technology. Through innovation, awareness, and affordability, we remain committed to empowering people with disabilities. Five years after launching our AI for Accessibility program, we have the opportunity to reflect on the progress made. Accessibility is core to our mission of empowering every person and every organization on the planet to achieve more, and we are grateful for our partners' contributions to this shared goal.

Our rapidly changing world contributes to the rising demographic of disability, which can impact anyone at any time. In today's connected world, access to technology and the internet are central to the way we operate and connect. As education, healthcare, and other critical services become increasingly dependent on technology, we recognize that accessible technology (AT) is fundamental to a more equitable future. It is the vehicle to inclusion for people with disabilities, which is why we consider it to be a fundamental right.

Accessible technology is fundamental to a more equitable future for everyone

Responsible AI has the power to accelerate inclusion. By incorporating representative data and building for accessibility from the beginning, technology helps meet diverse needs, complement strengths, and overcome disparities in almost every area of life. Startups, nonprofits, researchers, and others have developed AI and AT to serve the needs of the global disability community. We are eager to share examples of our AI for Accessibility partners' projects in the two years since our 3-year report. Their research, pilots, prototypes, and solutions are working to bridge what the World Bank calls the disability divide. We hope their impact will inspire you to begin or continue your own efforts to expand what is possible through technology.

Learn more Bridging the Disability Divide through Digital Technologies

Disability divide:
The gap in societal inclusion for people with disabilities, including in education, employment, and access to technology.

Impact overview 2021-2022

2 years
of AI for Accessibility

Annual revenue generated

Startups:
$20K – $650K USD

93
partnerships
with disability advocates, nonprofits, government offices and academia

88%
of grant projects included people with disabilities on staff

5,151
people reached through grant outputs, in 59 countries

854
people with disabilities compensated (studies, testing, etc.)

Accessible technology for all

Too often, technology is designed with accessibility as an afterthought. In contrast, the most effective and inclusive solutions are created by and with people with disabilities. Every company and organization can make unique contributions toward this goal. Our Accessibility Innovation Toolkit shares best practices to ideate, develop, and validate solutions that benefit all people.

Accessibility innovation tip

To design a more inclusive product, consider how it can meet a need or overcome an area of exclusion. Then involve potential users in its development instead of waiting for the validation and testing stages.

Discover more about how to be a thought leader in accessibility innovation: Accessibility Innovation Toolkit.

AI, when trained on data that includes people with disabilities, serves a wider base of users and can help bridge the disability divide. It is time to push accessible technology further.

Generative AI represents a new, exciting frontier for technology to benefit people across the spectrum of disability. By relying on AI to craft new content from user input, generative AI can reduce the time, effort, and mental load needed to complete a task. We encourage you to consider these examples as a starting point, and to develop your own use cases.

- **Image captioning:** Pairing generative AI with computer vision models can better translate images, graphics, and other visuals. This interpretation can benefit people who are blind and low vision or with other needs, such as cognitive disabilities.
- **Text summarization:** Generative AI based on large language models can accurately analyze and summarize text. It can also rewrite complex content in simpler, clearer language. This type of tool can help anyone's learning and shows great promise as a cognitive aid.

Expanding availability and adoptability of accessible technology

An estimated 1.3 billion people will need assistive technology (AT) by 2050. Too many people don't have access to the technology they need, though, especially those in low- and middle-income countries. While developing AT is an important step, we are also working to overcome barriers to adopting these solutions, such as cost, internet connectivity, maintenance, and lack of localization.

DAISY has developed an intuitive application to take advantage of the more than one million books available under the Marrakesh Treaty, which modified copyright laws to broaden access to books for people who are blind and low vision. The solution is compatible with basic mobile phones, affordable braille displays, and even solar-powered audio players to expand access and improve literacy in lower-resourced parts of the world.

The solution will increase the books available for education and employment organizations, schools, libraries, and individuals—and expand opportunities for people with print disabilities, regardless of their socioeconomic means.

Learn more Expanding the reach of accessible books

Go to DAISY The DAISY Consortium

Data for a more inclusive world

To make the future more accessible and inclusive, we need data that represents the spectrum of experience among people with disabilities. Companies, nonprofits, governments, and other organizations can use this data to advance accessibility, skills, development, education, and employment.

Data enables progress through training AI, informing policy, and enabling more inclusive decision-making.

Improving speech recognition

Speech recognition systems, such as those used on mobile phones and smart devices, are developed with AI and ML trained on a narrow range of voices and speech patterns. As a result, the technology may not recognize diverse speech patterns from people with Lou Gehrig's disease, cerebral palsy, Down syndrome, or other disabilities.

The University of Illinois Urbana-Champaign has launched the Speech Accessibility Project to make voice recognition technology work for a more diverse group of people. The project collects recorded speech samples from a range of people, then uses this representative dataset to create a more widely usable speech recognition system.

The project leverages the expertise of researchers, linguists, nonprofits representing communities that will benefit from more inclusive speech technology, and technology companies (including Microsoft, Google, Amazon, Apple, and Meta). The multidisciplinary group aims to ensure more people can have their voices heard.

Learn more About the Speech Accessibility Project | The moment is now: Shaping the future of accessible technologies

Designing inclusive policy, investments, and services through data

Data informs high-level decisions and investments, from education to disaster recovery. Yet a lack of data on people living with disabilities worldwide, along with the challenges they face, restricts the ability of governments and global development organizations to meet all people's needs. The World Bank, with support from the Disability Data Initiative at Fordham University and Microsoft, is developing an online disability data hub to provide this much-needed input.

The hub will help demonstrate how disability, gender, age, geography, socioeconomic status, and other factors interact to affect inclusion and outcomes. These insights will empower policy makers, advocates, and more to identify actions that address the complex hurdles faced by people with disabilities.

In addition to informing policy, the data hub intends to inspire cross-industry innovation, diminish myths and stigma, and encourage awareness of the intersectionality of disability.

Learn more Narrowing the data gap: World Bank and Microsoft commit to unlocking better development outcomes for persons with disabilities

Real impact for more people

AI for Accessibility projects empower people across the spectrum of disability. Our partners and grantees are accelerating solutions that are as varied as the strengths of people with disabilities. We are eager to share a sample of their work over the last two years in the areas of vision, hearing, neurodiversity, and pan-disability accessibility. We have learned from their progress and hope you will, too.

Vision

Expanding access to braille

The difficulty in accessing printed books, handouts, and school materials in braille can limit children's learning and, as a result, lifelong opportunity. The prohibitive cost of devices and even electricity for charging them can multiply educational barriers for children who are blind or low vision.

Vembi's Hexis-Antara solution, a combination of a braille book reader and content platform, is advancing literacy for children in India. The platform uses AI to convert books, school notes, quizzes, and other electronic content to braille. What's more, the kid-friendly device can last five to six days on a single charge.

By eliminating the obstacle and expense of printing books and school material in braille, Hexis-Antara is empowering more children to learn.

Learn more Accessibility Innovation: A talk with Vembi (the opportunity for low-cost assistive technology)

Go to Vembi Vembi Technologies

Making math more accessible

The inaccessibility of math education can restrict students' achievement in school as well as future opportunities. In the U.S., 75 percent of students who are blind or low vision are at least one grade level behind their peers in math. The education nonprofit NWEA is working to ensure students with vision disabilities have equal opportunity to succeed in math and beyond.

NWEA developed a prototype that enables students to get an overview of a math problem (similar to how someone with sight might take a glance), then choose which part of the problem to work on in-depth. The prototype provides students with the autonomy to work on one section at a time, which reduces cognitive load and puts them in control of their learning. The NWEA team believes the solution could overcome the limitations of other math AT and help students with disabilities demonstrate their math skills.

Learn more Making mathematics accessible

Go to NWEA NWEA

Hearing

Exploring the potential of sign language-enabled digital assistants

Digital assistants rely on AI to interpret and respond to users' commands for everything from controlling electronics to searching the internet to getting directions. The voice-based interactions that power these devices leave out an important customer base: people who use American Sign Language (ASL) and other sign languages.

Researchers from the Rochester Institute of Technology analyzed how people signed to interact with a digital assistant device. They researched and ideated on how users would wake up a device, issue commands, and respond to errors. Their dataset is publicly available so others can build technology and train solutions that recognize sign language.

Learn more

Analyzing Deaf and Hard-of-Hearing Users' Behavior, Usage, and Interaction with a Personal Assistant Device that Understands Sign-Language Input

The opportunity at home – can AI drive innovation in personal assistant devices and sign language?

Pairing AI and humans for real-time subtitles

More than 430 million people globally have a hearing disability, a number that is expected to increase due to aging populations and other factors. This includes more than 360,000 people who are Deaf or Hard of Hearing in Japan, yet many TV stations there do not have the specialized equipment or staff to add subtitles to live programming.

SI-com and its parent company, ISCEC Japan, have piloted a hybrid AI-human solution to meet this need. The cost-effective solution, called AI Mimi, was developed with extensive testing and feedback from Deaf and Hard of Hearing communities. The Azure Cognitive Services feature Speech Service uses AI to create real-time transcriptions, which trained human professionals correct as needed. The pairing of technology and people provides subtitles more accurately and faster than the traditional approach.

Learn more

AI-Mimi is building inclusive TV experiences for Deaf and Hard of Hearing users in Japan

Go to SI-Com

合同会社シーコミュ 合同会社シーコミュ (big-advance.site)

Neurodiversity

Empowering a neurodiverse workforce

People who are neurodiverse (such as those on the autism spectrum, with ADHD, dyslexia, or with other neurological variations) bring unique skills, perspectives, and capabilities to work. Unfortunately, traditional screening and algorithms may unintentionally exclude neurodiverse job applicants, one in three of whom are unemployed.

Mentra is tackling the employment gap through an inclusive hiring platform and community. The neurodiverse team used research, their own lived experience, and collaboration with their client base to maximize employment success for neurodiverse job seekers. The platform uses more than 70 data points to analyze and identify jobs where applicants are most likely to thrive. It also translates job seekers' nontraditional experience and skills, some of which may not be reflected on a typical resume or job application, for recruiters.

Mentra believes its solution results in improved retention, more fulfilling careers, and increased access to a diverse talent pool ready to make their mark.

Learn more Mentra is reimagining neurodiverse employment

Go to Mentra Mentra

Pan-disability

Increasing employment opportunities

People with disabilities have unique capabilities and lived experiences that benefit their employers. Yet in the U.S., people with disabilities have historically faced higher rates of underemployment. While these rates are gradually decreasing, 7.6 percent of people with disabilities were unemployed in 2022—twice the rate of people without disabilities.

Zammo, which offers a no-code conversational AI platform, has developed a chatbot to help job seekers with disabilities. The chatbot's straightforward question and answer interface allows users to interact with job search websites via text. By enabling people with disabilities to gather and digest information about job postings, Zammo hopes to open up career opportunities.

Zammo's chatbot also helps employers tap into an underutilized pool of potential workers, including those with low vision or blindness, who are neurodiverse, and who don't have the mobility to navigate a webpage. The solution can also be customized by adding information about job requirements and accommodations, or even incorporating the job application itself.

Learn more SaaS platform to empower job seekers and employers

Go to Zammo Zammo

What's next

We envision a world in which every person can use technology in a way that works for them. This fundamental right opens opportunities in every aspect of life.

Our dedication to accessibility continues during a time of exciting potential. AI and AT are rapidly advancing, making new solutions for disability communities possible. As companies, nonprofit organizations, and advocates push the limits of what technology can do in accessibility, we all benefit.

We invite you to continue your own efforts in this mission or join us today.

How to get involved

Apply for a grant:

Turn your idea into reality. Learn more about how AI for Accessibility can power your work.

Design for accessibility:

Use our Accessibility Innovation Toolkit as a springboard to examine your development processes and build accessibility into your innovation.

Learn more:

Get inspired by these resources:

- AI for Accessibility videos
- Disability intersectionality video
- Ability Summit sessions