



GARI GLOBAL ACCESSIBILITY
REPORTING INITIATIVE

USE WHAT'S AT HAND

Accessible consumer electronics
for assistive technology and service
delivery

This position paper builds on results from the 2021 GARI research project and discussions of these findings by an expert panel at the ICCHP AAATE 2022 conference in Lecco and in an educational session at the ATIA 2023 conference in Orlando.

Introduction

In their Global Report on Health Equity for Persons with Disabilities, published in December 2022, WHO estimates that “1.3 billion people – or 16% of the global population worldwide – experience a significant disability today”. Due to a lack of equal access to health, people with disabilities “continue to die earlier, have poorer health, and experience more limitations in everyday functioning than others”.¹

Some of the challenges that people with disabilities face, can be helped with assistive technology (AT)². “[A]ccess to appropriate, quality assistive technology can mean the difference between enabling or denying education for a child, participation in the workforce for an adult, or the opportunity to maintain independence and age with dignity for an older person”, WHO and UNICEF write in the Global Report on Assistive Technology³ published in May 2022. It is estimated that today already 2.5 billion people would require assistive products and that this number will increase to over 3.5 billion by 2050, due to our populations ageing. Research underlying the report showed huge inequity in access to AT: in some countries, nearly 90% of people in need of assistive technology have access to the products they need; while, in some other countries, it is only 3% who can access the technology they need.

The reasons for the lack of access to assistive technology are many and varied. The report lists as the foremost reasons: lack of awareness and affordability, lack of services, inadequate product quality, range and quantity, and procurement and supply chain challenges.

A research study around the GARI project showed that several of these issues could be addressed by integrating accessible information and communication technologies (ICT) such as accessible smartphones, tablets and wearables into AT delivery. Indeed, more and more features that people with disabilities want and use are built into accessible consumer devices and many assistive technology services are delivered this way. However, since they are mainstream devices in most cases they do not qualify for funding in most provision schemes for assistive technology (AT), partly because many of those are founded on a medical model, partly due to a lack of knowledge about the increasing capabilities of these technologies.

So, we would like to raise the question: Should accessible consumer devices such as smartphones, tablets and wearables be fully integrated into assistive technology delivery and eligible for AT funding?

Discussion

Mobile technologies have become an integral part of modern societies and, for many people, have become the preferred means of access to employment, education, leisure, travel, and public services. The manufacturers of mobile technology devices, particularly phones and tablets, have increasingly made their products accessible to the broadest possible user base, building in a wide range of accessibility and assistive functionalities. The market leaders have joined together to provide better information to consumers about the accessibility of their devices via the Global Accessibility Reporting Initiative (GARI) within the Mobile & Wireless Forum (MWF).

GARI is a collaborative project bringing together a broad network of accessibility stakeholders and continues to evolve to respond to technological developments and feedback from the disability community. The latter included a recurring request for accessible consumer electronic devices such as mobile phones and tablets to be accepted as assistive technology (AT) and hence be eligible for AT funding where such funding is available. As a result, the MWF commissioned a team of 5 researchers to conduct an “Analysis of Funding and Provision Models for Mobile Technology for People with a Disability” in 2021. The study set out to investigate to what extent accessible mobile phones and tablets provide assistive functions and hence might be eligible for AT funding.

The research team investigated funding schemes in six countries (US, UK, Norway, Poland, Ireland, and Australia) and found that in most cases there was no funding for smartphones or tablets even though users emphasized how much they wanted and

used those devices in everyday life. With the devices becoming accessible, more and more users with disabilities prefer accessible consumer electronics to cover their needs – partially because these devices provide a range of accessible and assistive functions, rather than one very specific functionality, partially enjoying the use of mainstream tech and wanting to avoid the stigma (and often additional cost) of needing specialized technology.

Currently, however, most funding systems are not prepared to cater to this need, effectively denying access to these devices to many people with disabilities and ignoring also a means to bridge the gap in AT provision with technology that is both wanted by the users and can potentially offer unanticipated additional benefits.

Not only do our systems for AT provision need to evolve, but we need to rethink our concept of assistive technology in the digital world. This means shifting from the functions and the blurred definitions of assistive technology towards the impact and purpose of AT provision in the lives of people with disabilities. So far, the most effective in meeting the needs of users seem to be the systems that provide direct funding to people with disabilities, who can decide for themselves what they need and want for that money.

After investigating different funding models

ranging from domain-specific like education and employment, direct payments, and private and public insurance schemes, to not-for-profit and charitable funding, private funding, and the use of refurbished and reused models, the researchers concluded that mainstream mobile technologies can be a cost-effective way of providing people with disabilities with the technology they want and need, and that effectively a great many people with disabilities and their families are self-funding access to these technologies right now. But even so, when the pandemic hit, many people did not have access to the necessary technology to stay connected – neither the people with disabilities nor the care staff.

Also, the funding process that applicants need to run through is the same for a 5€ euro app as it is for a 15,000€ eye-tracking system. The funding schemes have been designed around traditional assistive technology, but digital AT is delivered in a different way.

The true value of accessible mobile tech devices which already provide built-in text-to-speech, voice input, word prediction, screen-readers, and a whole range of other accessibility features, lies in being the core for comprehensive and personalized solutions upon which other things can be built on – such as fall detection, AAC (alternative and augmented communication) functionality, sound-amplification and much more. With the additional benefit that mobile technologies are the preferred platform by users with disabilities.

From the user perspective, the distinction between consumer products versus special products for people with disabilities can be questioned. 10 to 15 years ago, no one would have predicted that smartphones would become the most used technology for people who are blind or visually impaired.

Now it seems the smartphone might serve as a universal remote control to access all other devices and services – if the technologies are interoperable. Many people with disabilities indeed would prefer to access the smart home and the range of connected devices via the personal, accessible smartphone.

Additionally, though, we need to provide education and training to people with disabilities and our senior users. Accessible and assistive technologies are great, yet training on their use is still necessary. As is the affordability of these solutions. Not even in developed countries every user can afford to spend 500 to 1000€ for technology, much less so in developing countries where the need for accessible and assistive technologies is even greater.

From a policy maker's perspective, we should not fight over definitions but focus on the outcomes for the users, enabling people with disabilities to get the products and services they need to lead a dignified and independent life. The WHO aims at developing evidence-based recommendations for policy development, and at supporting countries in implementing those recommendations. In this vein, the WHO just published The Global Report on Assistive Technology which contains new evidence on the needs for and barriers to accessing AT worldwide.

Similar to the WHO essential medicines list (EML), the WHO's Priority Assistive Products List (APL) furthermore aims to provide a model

list of products based on global experience of population needs, impact for users and their families as well as cost. Countries may adapt the WHO's Priority Assistive Products List according to their local context and prioritize public procurement in a way to meet the majority of their populations' needs. Out of the 50 assistive technologies listed in the APL, 25 are commonly integrated into accessible smartphones, as the 2021 research project⁴ showed.

In this context, the WHO is looking at both conventional AT and digital solutions in terms of their effectiveness in terms of money, time, and overall resources needed. Digital AT is not only about the product, it is the digital application of organized knowledge and skills related to assistive products, including systems and services. Digital AT is also about platforms for service provision and how the ICT infrastructure can be leveraged to train the workforce on how to better provide AT to people with disabilities, older people and people living with chronic conditions.

Digital assistive technology is the digital application of organized knowledge and skills related to assistive products, including systems and services. Digital assistive technology is a subset of assistive technology.

The accessibility built into the major technology platforms has been a game-changer and has accelerated the general use of technology also by people with disabilities. Functions like voice assistance and simple smart home technology have transformed the perception of their relationship with technology and possibly even their personal life goals for and beyond independent living. Building on this, we need to trust people with disabilities to be the experts in their own lives and about their needs.

One such new approach is the Assistive Technology Passport concept, developed by Enable Ireland and FreedomTech as a potential solution to address the current absence of control on the part of individuals with disabilities and older people in navigating a path towards independence through the use of accessible and assistive technologies. The AT Passport is a digital record of AT needs that seeks to ensure the provision of assistive technology to people with disabilities and older people in an effective, streamlined, and efficient manner. It places the owner or consumer of the assistive technology at the heart of the process.

So much mainstream technology is accessible now and hopefully even more in the future, factoring in emerging technologies such as artificial intelligence (AI) and autonomous vehicles. And with this, we need to set our sights much higher than for example just having a screen reader built-in. Also, with mainstream products having such impressive accessibility built-in, it becomes harder to justify the high costs of AT. Obviously, there will always be the need for some specialized technology, but many people with disabilities are well served with accessible technology.

And looking at our demographics, we will have to rely on accessible mainstream technology to enable our seniors to continue living independently for as long as possible.

To close the circle from industry, end-user, and policy maker to academia, let's look at several studies done at the University College Cork. Their research program was motivated by the recognition that people with disabilities use technology – whether the AT providers know about it or not. And that for the most part people with disabilities and their families were self-funding accessible technology outside the system.

Rather than using the usual metrics to assess technology use focusing on what deficit it was intended to equalize, the University College Cork team wanted to investigate the unanticipated side-benefits, as well as understand in what way people derive pleasure from the technology they are using. One of the studies looked into teenagers and young children with disabilities who were using smartphones and laptops, as well as young adults who had been provided with technology at a very young age, and explored the benefits of using the technology outside the traditional metrics. A more recent study is looking at the use of smart speakers, smart displays, and smart home technologies by people with disabilities, trying to assess their assistive potential.

The researchers also wanted to find out what the users themselves perceived as the possible risks around information privacy, data protection, autonomy, and security, and how they balanced those risks against the perceived benefits. There was a sense that the responsibility lies with the manufacturers who need to think about their users in a more nuanced way.

The team found it liberating to look at technology beyond just providing functionality. Coming for a great part from a service background, the researchers understood that their usual approach holds the bias of systems that are to some extent around how much people with disabilities are dis-serving the technology, and hence focusing too strongly on the aspect of cost-benefit analysis. The focus being on filling a deficit, rather than allowing people to explore and discover what the technology can do for them, in a person-centred rather than service-centred approach.

There are examples of countries trying to shift to person-centred AT delivery. Israel is rebuilding their AT system on a digital platform with a wide range of accessible, assistive, and mainstream solutions that the person with disabilities can choose from – including mobile technologies. This has allowed to move from a list of 40 approved products for the blind and visually impaired to a list of 400 funded technology categories and let the rate of abandonment fall to only 4% (while funded technology abandonment rates in other countries are up to 30%).

Australia too has moved away from approved equipment lists towards personal budgets that people with disabilities can spend on the technologies they need and want. And with this shift, there was a noticeable growth in the demand for accessible tablets and mobile phones over more specialized devices. In addition, the Australian AT scheme provides training for professionals but also for people with disabilities to work in the AT sector and become experts in their own domain.

Direct funding indeed seems the most promising in effective assistive technology provision: it empowers informed users to choose the technology they want to fulfil the function they need. And this might be an accessible smartphone rather than a specialized device or software. In selecting consumer technology, however, accessibility is only one of the important factors. In addition, users are concerned about cost, style, enhancements, interoperability, support, etc. The potential of consumer technology in AT provision is huge through the ease of use, the wide reach, the ease of distribution, the lower cost, and those devices serving as universal remote control and as a gateway to participating in today's society. The latter two are true for users with disabilities just as much as for users without disabilities.

Furthermore, as the 2021 research project suggests, the integration of accessible consumer devices in AT delivery promises a wider range of benefits to people with disabilities and better economic and social return on investment for the authorities.

In all the mentioned cases though it was noticed that information asymmetry is a problem. Neither AT professionals nor AT users have comprehensive information on existing accessible and assistive technology. The user needs this information though as a basis for making informed decisions, just as the service provider needs the information to recognize the change in offer and demand and adjust the system.

A survey among AT professionals in the UK indicates that the use of features included in mainstream accessible technologies, such as voice recognition, can support greater independence, less social isolation, and better therapeutic outcomes for people with

disabilities. The uptake of these technologies is however hindered by a lack of awareness and knowledge about the existence of these features in what is considered consumer electronics on one hand, and a lack of funding for such devices on the other hand.

This leads to situations where even if a mainstream device is funded for a specific function, the device is locked - meaning that everything that does not strictly serve the functionality for which the device has been provided, is being locked, cutting the user off from a range of other useful features.

Conclusion

Research and experience show that the potential of accessible mobile devices such as smartphones, tablets, and wearables is under-utilized in general and in particular in regard to filling the gap in assistive technology delivery. The reasons are manifold. As outlined above, there is a lack of awareness about the power of today's devices and the many accessibility and assistive features they come with. They also do not fit into the outdated definitions and understanding of what qualifies as assistive technology and rigid criteria for AT funding which cannot keep pace with technological developments. An additional perceived barrier is access to connectivity: subscription, availability, and cost. However, there are, in many countries, many different venues to get that access to the internet funded for people with disabilities. The issue is yet again knowing about the different funding schemes in this regard.

We need to ask ourselves: If we don't get it right for providing accessible mobile phones to people with disabilities, how are we going to get it right for Smart Homes, the Internet of Things (IoT), robotics, Wearables, remote access (to work), autonomous vehicles, mobility as a service, and the many exciting emerging technologies? How then do we merge the definitions for assistive technology, accessible consumer, and digital technology to allow for including the right device for the right person in AT provision? It becomes evident that the focus must be on function and feature, rather than detailed technical specifications that get outdated rapidly.

Fact is, mobile phones and tablets have been the first really pervasive technology in terms of accessibility. What do we learn from the

success of these devices and our current struggles in providing access to accessible and assistive technologies, that can inform both manufacturers of consumer devices and AT funding authorities when it comes to the next generations of technology?

Let's conclude with three main takeaways:

- There is a multitude of accessible and assistive features readily available in devices on the market.
- AT funding bodies need to remove artificial barriers to access.
- There is huge potential to combine lower costs with an extended range of functionality to cover a wider range of needs.

And building on these three takeaways, formulate a call to action.

Call to action

Policies and systems do not change overnight, but there are three key steps we can start with:

Use free resources for information on available accessible technology on the market and integrate them into AT provision.

Revise funding criteria to provide functionality rather than specific hardware or software.

Include training on how to use devices, features, and services – for both therapists and caregivers as well as users.

End note

This position paper builds on results from the 2021 GARI research project and discussions of these findings by an expert panel in the session on “Can Accessible Consumer Tech Bridge the Gap in AT Provision?” at the Joint International Conference on Digital Inclusion, Assistive Technology & Accessibility - ICCHP-AAATE 2022, Lecco, Italy. The panelists included David Banes, Director of David Banes Access and Inclusion Services & DATEurope; Siobhán Long, Manager, National Assistive Technology & SeatTech Services, Enable Ireland; Klaus Höckner, Director, Hilfsgemeinschaft der Blinden und Sehschwachen Österreichs; Wei Zhang, WHO Assistive Technology Program; Bryan Boyle, Lecturer, University College Cork; Sabine Lobnig, Director Communications, MWF/GARI.

The discussions were continued in two educational sessions dedicated to “GARI:

Finding accessible devices and other resources” and “Accessible, Assistive, and Available, Addressing barriers to the use of consumer technology” at the ATIA 2023 Conference in Orlando, Florida.

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Include training on how to use devices, features, and services – for both therapists and caregivers as well as users.

A Special Thematic Session on “Accessible, Assistive, and Available - Addressing barriers to the use of consumer technology” (<https://aaate2023.eu/call/sts/list/the-assistive-potential-of-digital-consumer-technology/>) at the AAATE 2023 Conference end of August in Paris will gather additional perspectives, present recent papers on this topic and give room to dive deeper into the discussion on how accessible consumer devices might help bridge the gap in AT provision.

Resources

Global Accessibility Reporting Initiative (GARI): <https://www.gari.info>

Global report on assistive technology (2022), by WHO/UNICEF: <https://www.who.int/publications/i/item/9789240049451>

European Disability Forum Position Paper on access, barriers and policy recommendations about Assistive Technologies (2021): <https://www.edf-feph.org/content/uploads/2021/05/2021-EDF-position-on-Assistive-Technologies-Final.pdf>

Opportunities for digital assistive technology innovations in Africa and Asia (2020), by GSMA: <https://www.gsma.com/mobilefordevelopment/resources/opportunities-for-digital-assistive-technology-innovations-in-africa-and-asia/>

Footnotes:

¹ <https://www.who.int/publications/i/item/9789240063600>

² We use AT as defined in the UNICEF/WHO Global Report on Assistive Technology: “Assistive technology is an umbrella term for assistive products and their related systems and services.”

³ <https://www.who.int/publications/i/item/9789240049451>

⁴ The project results have been submitted to AAATE 2023 and will be presented in the Special Thematic Session on “The Assistive Potential of Digital Consumer Technology” in August 2023. A reference will be provided as soon as the paper is published in the conference compendium.



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