



ITU Podcast Series: Technology for Good Episode 11 – Accessibility for all

Opening soundbites:

One of the biggest problems with persons with disabilities is that they're often forgotten. They're not included unless people think about how would a blind person activate this? How would a deaf person be able to use this, or how would somebody with autism be able to use this? People don't.

Andrea Saks - Advocate and deaf community telecoms specialist

Any gains that have been made in recent years have been kind of erased by the pandemic. So, one of the things that we're really focused on ...is to get people with disabilities back working.

Bryce Johnson - inclusive leader of Microsoft devices at Microsoft.

The assistive technology industry primarily has been creating solutions for high income group countries. And a lot of those solutions have not been meaningful for low-income group countries.

Dipendra Manocha - developing countries coordinator in need of training and tech support in the Daisy consortium. Co-Founder of Saksham

Augmented and virtual reality... hold huge promise for inclusion in some areas of disabilities, but in others they're very exclusionary.

Darren Britten - Australian Disability Clearinghouse on Education and Training

We need to ensure that persons with disabilities and specific needs can fully access ICTs not only as users, but also as producers and developers.

Malcolm Johnson, Deputy Secretary General, ITU

Presenter - Maximillian Jacobson-Gonzalez, ITU:

Welcome to Technology for Good, a monthly podcast series brought to you by ITU - the United Nations specialized agency for Information and Communication Technologies. In this episode we are focusing on ICT accessibility - specifically for persons with disabilities. People who identify as living with disability represent 15% of the world's population, which is currently around 1 billion people. Within this population there exists a very wide array of disabilities encompassing physical mobility, autism



and speech delays, persons who are deaf and hard of hearing, and persons with visual disability. Up to 70% of disabilities are invisible but they can still present a barrier to access and use of the growing range of information technologies available.

This episode explores innovations in the ICT accessibility space from established companies like Google and Microsoft to new software and entrepreneurial ventures developed by people living with disabilities who experienced and realized a need that was not being met and did something about it.

Many of the conversations in this episode were drawn from the “ICTs and Accessibility for Persons with Disabilities and Specific Needs” track at this year’s World Summit on the Information Society or (WSIS) Forum - the world’s largest annual gathering of the ‘ICT for development’ community co-organized by ITU, UNESCO, UNDP and UNCTAD.

Let’s start with Malcolm Johnson, ITU’s Deputy Secretary-General, on the ITU’s role over the past 30 years in connecting everyone and ensuring universal access to that connection.

Malcolm Johnson, Deputy Secretary-General, ITU:

Almost half the world’s population is still unconnected, but also there are particular challenges for people with disabilities, so they’re at risk of being excluded from the accelerated digital transformation that has been taking place over the last year due to this pandemic. ITU pioneered work on standards for persons with disabilities back in the 1990s and adopted the first international text telephone standard. Standards have an enormously important role to play in making ICTs more accessible. ITU’s ultimate objective, of course, is to have universal connectivity.

For this, we need to ensure that persons with disabilities and specific needs can fully access ICTs not only as users, but also as producers and developers. From academia and international organizations to civil society and the private sector, the participation of all stakeholders will be crucial in the fight for digital inclusivity.

Presenter - Maximillian Jacobson-Gonzalez, ITU:

One of the innovators and educators from the visually impaired community is Tiffany Brar - the founder of the Jyothirgamaya Foundation, a school for the visually impaired in India. Tiffany identifies herself as blind. Due to the discrimination she faced in and around the classroom she was motivated to create a safe space for others to learn how to navigate communication technologies, which she calls her window into the world.

Tiffany Brar - Founder of the Jyothirgamaya Foundation:



I'm blind, I'm Tiffany Brar. I run a mobile blind school and access technology training center where we go to the houses of blind people and train them in their houses first, like we counsel them on a one-to-one way. And then we give them residential training in daily living skills, orientation, mobility, and also in access technology, the basics of computing.

My father was an Army officer and due to his profession, I got a good education and also I got a chance to travel to different places, so I learned a lot of languages. And I said, OK, what about other people? I mean, even I had a tough time in school. I had a lot of discrimination in the class. I was thrown out of the class because I didn't stop talking, or I gave the right answer. And that infuriated the teacher because she was like, you're blind, what right do you have to give the right answer in my class? You're disrupting the other students. So I thought, I want to help my other blind friends. I want that they should not experience this kind of discrimination. So I started a mobile blind school. My first student was a girl of 12 and I taught her the basic computer use, the basic use of a Braille machine, and then we enrolled her into school. There were two boys, 28 years old and 24 years old, who had never been to school. I'm not kidding. They had really never been to school. And when I met them, I said, how would you like to learn computers? And they were like, "Computers! Can we learn computers? It's not possible." And I said, of course it has come to our training camps and we taught these two boys for five days, just the basics of computers. Then actually they said this five days is not enough. We need proper training. Only then we can really make a difference. So then we started a ten day camp and even that was not enough for them. So then me and my father and a few friends of mine, we registered an organization called Jyothirgamaya Foundation Leading to Light. And we started a residential training center with five blind people. We taught them computers and these two boys were part of it. And now they are both working in call centers and they have been able to pursue their studies with the help of technology. They both use smartphones. They both back up their apps and share things to Google Drive, handle Google Docs, they download screen readers, update Talk Back, and they tell me, hey, man, update this application, update that application. I mean, they tell me what to do now because I gave them just a kick start and they explored a lot of things themselves. ICT is very important to visually impaired people because it opens a door to a new avenue. ICT was my window to the outside world as a visually impaired person.

Presenter - Maximillian Jacobson-Gonzalez, ITU:

One of the key ways that persons with disabilities can use information and communication technologies is due to the use of standards. Andrea Saks is an international telecommunications specialist for the deaf and advocate for the deaf and



hard of hearing communities. She spoke to us about standards, what they are and why they are so important for ICT accessibility for persons with disabilities.

Andrea Saks, international telecommunications specialist for the deaf:

This subject is so vast, it applies not only to telecommunication, it applies to your refrigerators, it applies to your stoves, it applies to your television, it applies to your PC.

A standard is basically a document that people accept internationally to explain and to give steps on how to make something interoperable. In other words, if you want your telephone to be able to contact a telephone in China while you're in France, you have to have a standard that is recognized by both countries. What the ITU does is write standards so that people can use the technology of today in an organized way, which also is important for industry and also important for persons with disabilities to be able to access the different technologies that are coming out fast and thick.

Nobody's born with consciousness of disability awareness. There are problems with standards changing very rapidly as technology is moving faster and faster than the standards can come out to make them interoperable. So, the problems for persons with disabilities are twofold. One, that they are included and that they are included in a timely fashion because often they are forgotten. So that's one of the biggest problems with persons with disabilities that they're often forgotten. They're not included unless people think about how would a blind person activate this? How would a deaf person be able to use this, or how would somebody with autism be able to use this? People don't. Unless you've got a disability or knows somebody with a disability, why would you know you're not born with that information?

So the consciousness of human beings is changing. And the awareness that you must design for use for as many people as possible, you can't design for everybody. It's impossible. But you can design a standard to be as inclusive as possible. But the one thing we don't take into consideration is standards are voluntary. Nobody has to implement anything they don't want to. So the consciousness of the people who are manufacturing from standards is also something that has to be raised.

Presenter - Maximillian Jacobson-Gonzalez, ITU:

As awareness of universal accessibility design grows amongst policy-makers and technology producers, some of the biggest players, such as Google and Microsoft are stepping forward to apply and adapt the latest in technological developments. Brian Kemmler, Accessibility Product Manager at Google tells us more.

Brian Kemmler - Accessibility Product Manager at Google:

Google's mission is to organize the world's information and make it universally accessible. And disability is a massive space. There's a fairly significant set of about a billion people who self-identified with disability. But when we expand that to include



their friends, their family, their loved ones, people, they connect with that work, then that really means all of us. And it also means all of us from the standpoint, as I think we've all learned in the last year with COVID and quarantine and so forth, we rely on technologies like Zoom to connect with people.

And if these technologies are not open, if they're not accessible, if they're not designed universally and inclusively, then we're excluding people. And if we exclude people, we're limiting our ability to connect with other humans. When you design inclusively and you design universally, not only are you meeting the needs of typically underserved populations, but you're also opening up design opportunities for everyone. So if you design a city with curb cuts, that city becomes accessible not only to people with wheelchairs, but also to anybody traveling, a delivery person, somebody with a stroller and so forth.

We've had some really interesting opportunities at Google to bring some of the advancements and innovations that we have in signal processing, as well as an automatic speech recognition to meet underserved needs for these communities. So if you were to look at the deaf and hard of hearing population globally as if it were a country, it would be the third largest country on the planet, just behind China and India. And so it's a massive number of users. Google has had a lot of advancement in automatic speech recognition and natural language processing. And we've been able to take and leverage this technology to create new experiences, to make audio accessible for people with deafness or hard of hearing. We also created a product called Live Transcribe and Live Transcribe as a very simple idea. You can have an actioner in your back pocket with your smartphone. So if you're unable to hear you simply take out the Live Transcribe app and the Live Transcribe app is able to transcribe speech in real time, it's also able to do other things like detect sound events and based on sound events, send notifications. So you can imagine if you're not able to hear a fire alarm that's going off because it's just audio feedback, this is a very powerful feature because you can hear that that alarm is going off. And then with that, it's basically able to send you a haptic and visual notification to let you know that that is happening.

Presenter - Maximillian Jacobson-Gonzalez, ITU:

There is another side of accessibility and that is affordability. Dipendra Manocha is the lead of training and technical support and coordinates projects in developing countries for the DAISY Consortium, which is a network of 190 organisations providing services to persons with blindness and low vision. He is also a member of the Executive Committee of the World Blind Union and is the co-founder of Saksham an NGO focused on assistive technologies and education. Visually impaired since childhood, Dipendra has dedicated his life to building communications and training infrastructure



and then mainstreaming that in society, to make access as widespread and normalised as possible.

Dipendra Manocha - Coordinator for Developing countries in need of training and tech support, Daisy consortium and Co-founder of Saksham:

Assistive technology is generally developed for high income group countries. Those solutions are completely unaffordable because of the difference in the income levels between the high and the low-income group countries. So, in a country like India, the solution really had to be customized. It can't really be copy pasted from other regions because of the local language, solutions, affordability, support, etc.. All those needs. For example, the smartphone software was something which was available in the international market at about four hundred dollars, and we were able to reconfigure it, make local language support and make available the same solution in India at just about one hundred and twenty US dollars. So that was a big change without any subsidy. We have to sometimes build solutions which are specifically usable within the local circumstances. Development of Smart Gain in India was one such examples where similar solutions for identification and mobility for persons of blindness was available at more than a thousand dollars. And we redesigned and redeveloped that solution suitable for our circumstances and the environment in a developing country like India. And we were able to bring down the cost to just about 60 US dollars. And yes, it was more usable within the circumstances that existed because the general environment's mobility environments are very different.

For a very, very long time we have been to exhibitions of assistive technology and always just admired technologies from a distance, saying that all while what a technology, but not something that we can possess ourselves. So that is something that we wanted to change in India and that is where we started. One of our projects is the audio description of films. There was no awareness among the film producers and there was no awareness among the users also. So we started to work with producers because our main aim was to be mainstream and that this audio description should become part of the normal mainstream film production system for Bollywood and India. And that is how now the OTTs, for example, several audiences have started providing audio descriptions on their own.

Presenter - Maximillian Jacobson-Gonzalez, ITU:

While both Tiffany Brar and Dipendra Manocha experienced disability since birth, disability can be situational, temporary, or permanent, and occur at any point in a person's life. Our next guest Martin Bedouret experienced disability later in life after being diagnosed with ALS (also known as motor neurone disease, is a neurodegenerative neuromuscular disease that results in the progressive loss of motor neurons that control voluntary muscles) in 2016. This is when he co-founded C-board,



an Augmentative and Alternative Communication web application for children and adults with speech and language impairments.

Martin Bedouret - Co-Founder and Developer of Cboard:

The story of Cboard is a story about helping people with disabilities, and that is also including me as I am myself, a person who needs a lot of help from others since my ALS diagnosis five years ago. At that time, I was suddenly introduced to a new world of disabilities and as a good engineer, I found a world of technology challenges. Many questions came to me, but the most important was related to communication. How can you communicate with others if you have no voice? And even worst, how can you learn to communicate if you are a child with learning difficulties or impairments? Communication is the ultimate goal for our project called Cboard, it is a web app for children and adults with speech and language impairments, aiding communication with symbols and text to speech. It can be used with children in order to develop language for those with pathological conditions such as autism, cerebral palsy or Down's syndrome.

Cboard is designed and built for the web. This allows any device capable of running a modern Web browser to be able to use Cboard. At the same time, the application is available as a standalone app format in the download stores. We have learned that the most interested are not the technologically advanced countries, but on the contrary. The project has been having a very good impact in places with few resources and with less popular languages. That is why the support of multiple languages was a design pattern from the beginning.

I think that communication is the most important capability for humans. Language shapes your mind. When I started to lose my ability to speak, I started to think differently. I found myself being less social. That was something that I could handle as I was conscious of my sociability loss. But what about children with autism or cerebral palsy who are prevented to talk from the very beginning of life? I think that technology and ICTs play a major role in helping them and collaborating on language development, latest developments and emerging technologies like artificial intelligence should improve the lives of people who can't speak. No speaking, it doesn't mean no thinking, and I am sure that soon we will have interfaces between the computer and brain that will give a voice to people who have lost their speech.

Presenter - Maximillian Jacobson-Gonzalez, ITU:

Darren Britten of the Australian Disability Clearinghouse on Education and Training provides us with a realistic view of some of the issues we still face with new emerging technologies. reminding us that as every new innovation is created, there is a potential for exclusion of one group or another, but that remaining aware of this is part of preventing that exclusion from occurring.



Darren Britten - Australian Disability Clearinghouse on Education and Training

It's very easy for content creators to make inaccessible information. Emerging technologies, and certainly improve some access, but they'll continue to create new barriers and old issues in 2003, where we need to convert things from printed hard copy into electronic formats. Now we've got all these things, the electronic formats that need to move into different electronic formats and in some cases go back to hard copy or braille for students, etc.. Not all students can afford the latest technologies or have high speed Internet access. Augmented and virtual reality, which universities are certainly jumping on, They hold huge promise for inclusion in some areas of disabilities, but in others they're very exclusionary. It's a very visual medium. We now have multiple mediums for information and teaching often takes the form of an aggregation of information in one single session. You've got audio, video, text, images, group interactions, whiteboards, polls, quizzes, etc. So there's no one thing. It's not just text from a textbook that might be getting committed. It'll be a whole range of interactions that need to be suitably made accessible.

Presenter - Maximillian Jacobson-Gonzalez, ITU:

Here's Bryce Johnson, inclusive leader of Microsoft devices at Microsoft and one of the inventors of the Xbox adaptive controller, which provides people with limited mobility with a chance to play alongside more abled-bodied people.

Bryce Johnson, Inclusive Leader of Microsoft devices, Microsoft:

This is a device that we made specifically to empower people with limited mobility to play video games, if you think about a standard game controller. These devices have been optimized to add more buttons and to give people more functionality. But they've been optimized around a primary use case that makes a lot of assumptions around how they're used. These things assume that I have two hands to hold it and that I have two thumbs for these thumb sticks. It assumes that I have the index finger to reach around to these bumpers and trigger on both sides.

And it assumes that I have the strength and the endurance to hold it. And the thing about this device, even though we love this controller, our beloved Xbox controller, we had to recognize at Microsoft that if a person couldn't use this because of a disability, that this was the problem. Right. We created the problem. It's not about the person. It was about us. We created this device. This device was the barrier that someone was coming across when they couldn't play games. So we had to solve that. So a lot of people will come to me and they'll say things like, I need a one handed controller because I only have one hand and that and they're coming from a place where they're telling me what they don't have. And what I really want people to do is tell me what they do have, because then we can define a controller that fits them. Right. So tell me, like, I can move my head, I can move my elbows, I can move my feet, I can pinch my knees together. These are the types of things that we look for when we're defining a



controller for people with limited mobility. I think at Xbox one of the things that we have to recognize is we talk about the fact that there are billions of gamers in the world on our own platforms. We have, we have members of our own platforms that are larger than many countries. So, of course, we have to take this seriously. It's our responsibility to make sure that when everybody plays, we all win.

Presenter - Maximillian Jacobson-Gonzalez, ITU:

You may remember Joanne O'Riordan from the last episode of this series. Joanne was born with Total Amelia, which means she was born without any limbs. As only one of 7 people in the world born with this condition, Joanne is an extraordinary person and has gone on, with the help of technology, to work as a sports journalist, and as a disability advocate.

Joanne O'Reilly - O'Riordan - disability advocate and sports journalist

My first actual piece of tech that I had from a young age actually was a PlayStation One. And I used to play with my siblings all the time. And funnily enough, the skills that I learned from beating my siblings at PlayStation are the skills I need to drive my car safely. I suppose, when I was growing up, technology was a huge part of my life. A woman by the name of Christine O'Mahoney. So we didn't know her, even though she lived just a few villages over from my house, she basically learned how to code before coding was good and she learned how to rewrite software programs. And yeah, so she basically put together a software that we would now kind of take for granted. You know, she put together a PDF system that linked up to Microsoft Word to hyperlinks, you know, all these kinds of different things just to facilitate me to do my schoolwork. the tech that is out there for people with disabilities, it is generally quite good. And I think the nice thing about the tech that is out there is that everyone uses it. You know, when I got into journalism, I was well, you know, I thought I was going to be the only one doing speech to text. And then obviously I hopped on and I realized that everyone is using a transcription service of some sort to get their interviews done. So weirdly, I was the weirdo in the corner, like talking to my computer. You know, everyone's lives can be made easier through a variety of means with technology.

Presenter - Maximillian Jacobson-Gonzalez, ITU:

Here is Andrea Saks, international telecommunications specialist for the deaf and advocate for the deaf and hard of hearing communities, back to tell us a story from her own life. Both her father and mother were deaf, and since she could speak she supported them to communicate with the hearing world. The story she tells is a prime example of how designing and innovating for disabled communities can lead to immense benefits that affect and influence the entire world.

Andrea Saks: International Telecommunications Specialist for the Deaf



Telecommunications was exasperatingly difficult for persons who were deaf and hard of hearing because of the fact they couldn't access it, they couldn't use the telephone. My father was actually clinically one hundred percent deaf. He was an electrical and a mechanical engineer. He had another colleague who was totally deaf. My father's name is Andrew Saks. The other gentleman he worked with who was technical, was a gentleman named Robert Wietbrecht. There was another guy who was a deaf orthodontist anyway, named Jim Marsters. They got together and decided that they wanted to use the telephone. It was actually Bob who designed the modem with a teleprinter, and that's how it was used in those days, it's in the sixties we're talking about with a modem and a teleprinter. Most people don't know what a telex machine is. You're all too young. Telex machines, if you look at old black and white films, you'll see them. It was like the telephone, except it didn't use voice. It used data so that people could print what they were talking about live and in real time. When you see the films that say, I just got a telegram, that's how a telegram was sent. And that's how the deaf community began to communicate.

Everybody's got an iPhone and you do texting. What you do, texting really came from the deaf community. Because they couldn't use their voices to speak on the phone in the last century, we didn't have iPhones, you talked on the phone and somebody had to hear what you said. The deaf community was the first group of people to use text like a telephone as their interpersonal communication mode. You can thank the deaf community for what you take for granted in your little iPhone and in your little Samsung and then your little or whatever you have with texting. The deaf gave you interpersonal long-distance text. And nobody has ever said thank you.

Presenter - Maximillian Jacobson-Gonzalez, ITU:

Given the growing proliferation of devices in our lives, it is vital that persons with disabilities or rare diseases can fully access information and communication technologies and use ICT for their social and economic development. Digital accessibility is key to ensuring respect for everyone's right to participate in an interconnected world. Here are some final words from some of our speakers. First, Brian Kemmler from Google.

Brian Kemmler - accessibility product manager at Google:

Designing any product. Is difficult, even if you use the product every day. So the question becomes, if I am not a user, how do I, as somebody who is a developer of products, build empathy for the people I'm helping build products for? I need to build products with the community to make sure that the things that we're building are not the things that we think are good for people. We know they're good because we've tested them and we built them and we jointly design them. That takes a lot more effort than the standard way that we build products, but we think it's worth that effort. We think we get better products, more inclusive products and products that make a bigger difference and have a bigger impact for people.\



Presenter - Maximillian Jacobson-Gonzalez, ITU:

Here's Malcolm Johnson ITU Deputy Secretary-General

Malcolm Johnson, Deputy Secretary-General, ITU

Since the start of the COVID19 pandemic ITU has addressed the needs of those with disabilities or specific needs, by taking a number of measures, including updating our online resources and developing guidelines for decision makers and communicators on how to make digital information and services accessible to people regardless of their disability. And ITU, as the UN specialized agency for ICTs recognises that the principles of universal design, affordability and equal opportunity to access ICTs and assistive technologies are key to building inclusive societies.

Presenter - Maximillian Jacobson-Gonzalez, ITU:

Finally, Darren Britten of the Australian Disability Clearinghouse on Education and Training

Darren Britten - Australian Disability Clearinghouse on Education and Training

There is definitely a divide, but I think consumers also have some power as well. There's a huge buying force in Australia, and even to America with different acts and standards, that a lot of websites are certainly becoming compliant if you're buying things from them because they realize they're missing out on a huge body of people. If they can't access it or even find your goods, they're not going to buy them. There'll be new things that will fix things and there'll be other things that are just going to create new barriers. But I think that's the wheel that we're on.

Presenter - Maximillian Jacobson-Gonzalez, ITU:

We'd love to hear from you about the subjects you would like us to explore, and what you think about the discussions on each topic we cover. So, write to us at podcasts@itu.int and visit our website at www.itu.int

We look forward to continuing to explore the technology that plays an intrinsic part of our everyday lives and discovering which technological developments can be utilised for good on the road to connectivity for all.

If you've enjoyed listening to this programme, please don't forget to subscribe to ITU podcasts. You can find us on Soundcloud, Spotify, Apple Podcasts, and more, as we try to dig ever deeper into how technology can truly serve the greater good for all the residents of our planet.

For Technology for Good and ITU, I'm Max Jacobson-Gonzalez.

Technology for Good, an ITU digital production.

