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Hear2Read, an app for all ages



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Hear2Read, a 2013 empowering initiative by Suresh Bazaj, uses Text to Speech (TTS) software to convert visual content into an audio format. Hear2Read supports eight Indian vernaculars, with Malayalam being the most recent addition in August 2019. An Assamese version is in the offing.

Suresh Bazaj

Impressionable Age

Google Playstore reveals that 3,500-4,000 visually impaired (VI) people in India use the Hear2Read app every day. That's the number of online lives that Suresh Bazaj has improved. The offline user community remains unaccounted. Bazaj who moved to US four decades ago, prospered and grew in stature while working in the computer and communications technology industry. When he decided to hang up his boots, he could have just led a cushy cocooned life. Or at the most, the Silicon Valley entrepreneur could have been an occasional giver by opting for cheque book philanthropy. Instead, he chose to improve the lives of the VI in India. The experience has been satisfying. The outcome as we all know is Hear2Read, an NGO that bridges the digital divide for blind

and low vision Indic language speakers. At a deeper level, the NGO connects Bazaj to his desi roots.

“I spent my formative years in India though I moved to the US after celebrating my 21st birthday,” said Bazaj, in a Skype call from the Bay Area in the US.

His rootedness coupled with a sensitivity to do something for society has given him a direction. His father supported a school for VI boys in Varanasi where he grew up. “The images from my childhood were pretty sad and depressing. I only saw blind children and adults begging — mostly on train stations and occasionally near shops. I do not recall seeing VI children outside schools for VI children in the US,” he regretted.

Handy firsthand experience

The project took off with the entrepreneur’s investments and donations from friends, family and other NGOs that serve the VI community in India. His firsthand experience has revealed complexities in the VI space. Hence Hear2Read is available free of cost with zero monetization. “All Hear2Read Apps are free across the globe regardless of the user’s age and visual capability,” he added.

The institutes that have been teaching Braille mostly prefer audio books. Not everyone is open to adapting new technologies. Many schools have banned children from using Smartphones, due to their misuse. This proves a dampener in case of the app. Other deterrents include the cost of Android phones and tablets and the fact that all teaching faculty may not be fully equipped to teach the use of Text To Speech technology. The solution, Bazaj felt, could be met through open source software. “The importance of Braille is unquestionable; however, the visually impaired also need the ability to read all of the material available to people with normal sight. In addition to hard copy books, today we get digital information in form of email, documents, spreadsheets, presentations, websites, eBooks, Twitter® and Facebook®. Printing all of these in Braille is neither practical nor timely,” he felt.

Enabling Technology

Bazaj scouted round for open-source software that can run on low-cost Android devices selling for \$100 or even lesser in India. Finally, Prof Alan Black of Language Technology Institute (LTI) at Carnegie Mellon University (CMU) helped shape his dream. Dr Alok Parlikar, his PhD student who had already started work on modifying the Festvox TTS Framework software to support Hindi, volunteered his time. Subsequently, Hear2Read sponsored research at LTI under the direction of Prof Black to extend Festvox to support all Indo Aryan and Dravidian languages.

The umbrella open source platform is known as Festvox. It has many parts including Festival, Flite (Festival Lite), Edinburgh speech tools and Mel Cepstrum vocoder. It supports several different text to speech (TTS) technologies that require varying amount of computing horsepower. Hear2Read uses ClusterGen Statistical Parametric Synthesis (SPS) as it has low memory requirement (typical database is 20 Mbytes) and low CPU utilization. So it allows low cost Android devices to generate synthetic speech in real-time.

The Android App consists of the Hear2Read TTS Engine and a separate TTS database (called Voice) for each language. Users need to install the TTS Engine and add one or more voice App depending on the language of the content they wish to read by listening. With TTS software, the visual content converts into audio for individuals to read books, documents, e-mails, and messages like SMS, WhatsApp and Skype messages. The software works in conjunction with various screen reading Apps like Talkback (part of Android OS), @Voice Aloud Reader, Simply Reading and Voice Dream.

The TTS was first in Hindi. Close to its release, Google came up with a Hindi TTS for Android in December 2014. "We decided to not release Hindi TTS for Android and started working on extending the software for other Indic languages," said the former IITian, by way of explanation.

After 20 months, the Tamil TTS Android App was released for general distribution in August 2016.

The Apps are being used by all age groups ranging from age five to those in their 70s and 80s. "Though we set out to help VI children get the same education as sighted children, we realized that the Apps are useful for five different demographic groups," said Bazaj. The enthusiasm in his voice exemplifies the seriousness of his purpose.

School children access the app for equal education opportunities. Nisha D'Souza, a 5th Grade student at Mumbai's St. John's Universal School said that she uses the tablet daily and described its talkback facility as awesome. "Of course I do have a keyboard attached to it as it makes typing faster. I am now happy to learn the swipe technique and use the tab with much ease. As it is very convenient to use I now read all my stories on Go Read or Darwin Reader," said the student, who uses YouTube and chats with friends on WhatsApp.

Other insights follow. Haroon Kareem TK, a X standard student of GHSS Mankada School, Kerala. Haroon uses Malayalam Hear2Read TTS. This has helped him prepare a project in Malayalam, as per the state government. Last year, a similar project compelled him to reach out to someone for assistance. Probably this is why he missed the top three scores and came fourth in ranking. While fingers are crossed for this

year's project, Haroon is preparing for a science fest. That's not all. The student is key member of the Chakshumathi Assistive Technology Centre, besides being a beneficiary and role model for other VI children.

Chakshumathi is a nongovernmental, not for profit organization based in Thiruvananthapuram, Kerala. Positioned as an "Empowerment and Assistive Technology Centre for Blind," the 2011 organization is a member of DAISY Forum of India. It provides training in the production of books and other materials as per the DAISY format.

Working age adults use the app for equal employment opportunity. Take the case of Sudha Rajagopalan, who lost her eyesight due to corneal problems in 2008. "In the hope to get my vision restored, I spent a couple of years focusing on treatments. Meantime, I was inspired by a visually impaired who used assistive technologies (AT) to transcend his disability," she recalled and equipped herself with AT. She pursued her passion to be a Harikatha exponent or spiritual story teller. The mission is fulfilled by TTS, through which she searches the web, watches YouTube, process emails and listens to recordings. "It was truly a dream come true when I found out that I could use Hear2Read TTS for reading Tamil books," she expressed in 2016 as she read Washingtonil Thirumanam by Saavi.

VI elders with loss of vision due to old age diseases rely on the app. People across age groups who can understand spoken words but cannot read text in that language are also using the app. In simple terms a person from the south staying in north India may understand Hindi but cannot read written Hindi. And vice versa as well. Another group consists of children of immigrants outside India who wish to learn their parent's native language.

Partners in India promote TTS technology as a provider of equal education and employment opportunities to the VI community. Daisy Forum of India (DFI) is the NGO's umbrella organization. "DFI has over 150 member organizations. We have developed strong relationship with many of them who understand the benefits of TTS and are actively promoting it with Ministry of Social Services and Empowerment," he explained. These NGOs are also active in making all textbooks available in digital format (DAISY and ePub3) that can be read using TTS software.

Clearly the cause has come from Bazaj's heart.

Fact File

The Engine App (Release 2) has been installed by over 31K users; some have installed it on multiple devices. Over 2,200 new users installed it during September 2019. Almost 90% users are in India

The number of active users on most days is around 3,500

The number of active users for Telugu TTS on most days is about 1,200. Telugu is the highest use App. Some users use Hear2Read to read content in more than one language