This app is enabling the visually impaired by converting text into speech in 6 Indian languages

By Mehr Gill

November 6, 2017

Hear2Read is an open-source text-to-speech application that aids learning for the visually impaired. The application runs on phones costing as low as Rs 7,000 and tablets as low as Rs 5,000. Presently, there are six apps – one for each language.

According to the World Health Organization (WHO), there are approximately 253 million visually impaired people in the world, out of which 36 million are blind, and over 217 million have moderate to severe vision impairment. India hosts a third of the world's visually impaired population. But often, they are not equipped with the tools and facilities that can help them shine. Taking this into account, Suresh Bazaj wanted to work with visually-impaired people, harnessing technology to help them lead a life of dignity and independence.

So, Suresh, 67, started [Hear2Read](#), a voluntary initiative in 2013.

Suresh's investments along with donations from Access Braille and Indians for Collective Action, among others have helped to take the project off the ground. The Tamil TTS app was launched on 2nd August, 2016. It was developed in collaboration with Carnegie Melon University (CMU), where Professor Alan W Black, fourstudents of CMU and a number of volunteers helped in carrying out the research and implementation of this project.

Prof Black advised Suresh to take help from students who could help him with research. That remains to be the biggest expense borne by him, since he spent $70,000 by partially funding the masters' degree for the two students who helped him with research.

The coming together of an idea

Suresh worked in the US since 1973, and quit his job in 2012 – post which he starting working on the application. Having experienced retinal detachment in both his eyes, he wanted to do something for visually-impaired people. Suresh was able to recover from his retinal detachment because of superior medical treatment available in the US.

In the US, he met visually-impaired people whose quality of life was way better than their Indian counterparts. This made him realise that visually-impaired people in India were not as educated and, therefore, lacked the opportunities to do well in life. "Back in India, a visually-impaired child is put in a back room, the parents are ashamed of him as they don't want to raise a blind child," he says.

In his hometown, Benaras, his family supported the [Shree Hanuman Poddar Andh Vidyalaya](#). "Even though my family was supporting the school, the outcome made me feel sad," he adds, referring to the low quality of education. "Very few, maybe one out of a hundred, would be educated enough to support themselves. Rest of them would be stuck doing menial jobs such as making candles and chairs," he adds. Suresh also said that getting education through braille technology is very hard, another reason why he needed a technology-based solution to solve the problem.

The app's functioning

A majority of the voluntary work to build the applications went into, finding prompts, recording the voices, building the voice database and making it flawless such that it could be used seamlessly on Android devices.

Essentially, the app uses Google's, Android Talkback accessibility feature that can read out Word documents, text or HTML files, SMS texts, Facebook postings, WhatsApp messages and e-books, without Internet access. Google's TTS for Android is one of the commercially available TTS features that supports 22 languages, including Hindi and Bengali.

The app is available in Kannada, Marathi, Punjabi, Gujarati, Malayalam and Telugu. They are not integrated since that would require more space, which would lead to loss of performance on low-cost phones.

"A lot of work went into making the app robust. There is a significant difference between what you can demo in a lab and making it into a robust product that can be used by somebody other than the developers. For a product like this, being 90-95 percent accurate is not good enough. If I want people to actually use it, I need to be 99 percent accurate," says Suresh. Siddalingeshwar Ingalagi, 26, has been using the Hear2Read Kannada version since 6 months to 'read' newspapers and documents. He was happy with the pronunciations and accuracy of the app and added that the speech can be problematic for longer texts, a problem he has reported to the developer and Suresh.

For the pronunciations to be accurate, a group of volunteers heard the TTS outputfor each of the languages and gave feedback, covering aspects of the quality, fluency and pronunciation.

To execute the idea, words between the range of half-a-million to a million were procured from open source and added to the app's database. Henceforth, fluent native speakers of each of the languages were identified, who then volunteered to record around 1,000 of the most common sentences used in each language. These sentences were identified through this open source repository, which contain the most frequently used words in a particular language."Often, we ended up going through three to four speakers before finalising on one," he adds. This, along with the machine learning system, makes the conversion from text to speech in real time possible. A developer's work is required to carry out the large-scale computing to create these databases and, then, to make the machine learning system flawless, such that real-time conversion is possible.

Challenges and the road ahead

One of the biggest challenges in the project's path has been convincing the people to use the app. "Initially, I thought that the product will work and we'll get 50,000 downloads instantaneously, which was not the case at all," he says.

This is the reason why Suresh and team are shifting the focus from developing the app to promoting it. In order to accomplish this, Suresh envisions starting a programme where he can hire trainers who can spread awareness faster. These trainers will do the work of evangelists in different cities and through workshops, and will be able to get in touch with people who could benefit from the app.

The trainers will also teach the people how to use the application. One such evangelist is Usha Dev who got in touch with 12 Marathi-speaking visually-impaired children in Pune. With the help of Hear2Read and the training given by Usha, the kids can now read their school textbooks' e-versions. Under the government's Assistance to Disabled Persons for Purchase/Fitting of Aids/Appliances (ADIP) scheme, people with disabilities are eligible to get appliances, including tablets, that aid their development.

Additionally, Hear2Read is looking for more funds to make this possible, along with collaborations with NGOs, organisations and blind schools across the country. Suresh also wants to start a master trainer programme soon, where experienced teachers will be taught methods for further teaching the visually-impaired people.

They hope to launch the Windows version by this December. More languages might be added soon, depending upon the inflow of funds. "I get messages from India and elsewhere almost everyday, asking me to come out with a new app. Once I have the resources, we will resume our work on the development front," he concludes.