

Leveling through tech: Avaz, a special app for children with special needs

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PHIL SCHILLER is listening in rapt attention, the excitement clearly visible on his face. Ajit Narayanan is giving the visiting Apple executive a lowdown on Avaz, his iPad app that helps speech therapists teach autistic kids to communicate. As Narayanan shows how autistic children can learn to string sentences using the pictures in the app, Schiller gets deeply involved, even trying out a few phrases himself. Clearly, this is an example of what Phil later explained as a great leveling through technology, "creation of opportunities that did not earlier exist".

"All that matters is the idea, how good is the opportunity that you want to create... to the extent that it increases diversity and the creativity of people... the whole world wins when that happens," the Apple senior vice-president told *IndianExpress.com* after a long session with a handful of Indian developers at the new Apple accelerator in Bangalore.

Narayanan's idea is doing just that. Avaz is now used by children with special needs all over the world and even the Tamil Nadu government purchased 197 Apple iPads with a Tamil version of the app pre-burned for children with special needs at aided schools in the state. The programme will start rolling in

the next academic year in Tamil Nadu.

Narayanan's journey with Avaz starts in 2007 when he returned to India leaving a Silicon Valley job. "I just wanted to become an entrepreneur and was not very sure what to do. I hung around with some professors of mine from IIT Chennai hoping to get inspired," he says, sitting inside Avaz Inc's new office on IIT Chennai's brand new research park campus. With some of the professors, Narayanan started helping out at Vidya Sagar Centre for Special needs in the city.

Narayanan is fascinated by looking at language from a science perspective. "I started investigating the boundaries of language... what's the difference between Bengali and Tamil or Japanese and Spanish... also what's the thread that binds them that helps a two-year-old pick it up. That seems to be a remarkable property in all languages," he says.

This is when he started discovering the world of generative linguistics. "Nobody had even thought of bringing generative linguistics into the world of autism or disability." Interestingly, the spark came from a postage stamp on 6th century BC Indian grammarian Panini, considered the father of generative linguistics. "It struck me that his ideas from 2,000 years ago can be combined with the ideas in the field today and bundled into an app format for kids with special needs."



Ajit Narayanan, developer of Avaz.

While Avaz is the primary app for autistic children, priced at Rs 7,900 on the app store, the company has launched an add-on Rs 800 app called FreeSpeech which lets them intuitively string together more complex sentences. FreeSpeech also offers the therapists a precise way of knowing what

level the child has reached as it offers analytics at a granular level. The two apps together have over 50,000 downloads worldwide.

The larger opportunity is that this technology, because of its deep understanding of language and its pattern-based structure, could be of use beyond children with special

needs. Narayanan elaborates: "If this can be used by a child with autism, can it be used by any of us to communicate in any language?"

While companies like Google are also working extensively on language technologies, powered by artificial intelligence and machine learning, Narayanan is more keen on figuring out if there is a simpler way to reach this goal. "The teams here are also working on Google's technologies like Tensor Flow to augment what we are doing, but the approach is very different," he chips in. For instance, Avaz was created with a conscious design decision that it would work offline, while Google products need to pull in information from the cloud at a real-time basis. "The approach we are taking is that there is a lot of data available, and can this be converted into a small set of rules which can capture the pattern in this large amount of data," he explains, adding how language is very pattern driven.

"One of our core inventions is a very concise way of capturing linguistic patterns from this enormity of data and using those patterns to express language." The engine he uses, Narayanan explains, is only about 10,000 lines of code. "That makes it elegant," he says, adding how a lot of companies now just have a "brute force way" of tackling such problems because of the amount of data

available out there.

Being careful not to "over promise", Narayanan says his domain and application areas are very focussed at this point of time. "We are working for kids with special needs and those trying to learn a new language." But over time he has noticed that there are adults too who use the app, for language learning or because of disabilities.

However, Narayana, who calls himself a passionate engineer, is unsure if his technology can help someone with a stroke overcome the resultant communication hurdles. "That requires more research. Also, the therapy regimen for someone with autism is different to what you would have for someone with stroke."

But Avaz Inc has been expanding its outlook and has already launched a new app called Chong Chong English for Chinese children who want to learn English. So there are three staffers in China, along with the 15 in Chennai and a linguist in the US.

Despite Android being more accessible, especially in a market like India, Avaz has been focusing on the iOS ecosystem, because Narayanan thinks the special education market is dominated by Apple. Narayanan, the only Indian developers to have given a talk at WWDC, underlines the help he has got from Apple which considers his app "special".