Prof. M. Balakrishnan's Interview on Innovative Technology to Assist the Visually Impaired

Noida, Jan 15, 2018: Given the enumerable challenges faced by the Visually Impaired Community in carrying out day-to-day activities and living independently, empowering these 2.8 crore people (according to 2011 Census of India) became a mission for Prof. M. Balakrishnan & team. Developing Innovative Assistive Technology, Prof M. BalaKrishnan spoke about the Inventions that he & his team came up with to make the Visually Impaired completely independent - on the Eureka Interview led by T.V. Venkateswaran aired on Rajya Sabha TV.

Dr. Balakrishnan – Professor at the Computer Science Engineering Department, IIT Delhi, emphasized on 2 Major Challenges for the differently-abled, Mobility & Education. Starting with Mobility, he pointed out how visually impaired people found it very difficult to walk on a footpath comprising of multiple obstacles such as fallen leaves, stones, stray dogs, which led them to upper body injuries and lack of confidence. Contemplating such issues across every corner in India, Dr. BalaKrishnan & his team built Smart Cane– a cane that complements the functionality of white cane and senses obstacle distance through vibratory patterns. This smart cane with warning alert proves to be a significant solution to the impaired people in developed as well as developing countries because of its high affordability.

In line with the Smart Cane, Prof. discussed another assistive Technology based product - The "On Board" System, developed in collaboration with KritiKal Solutions. This system allows users to identify the route number of buses approaching the stop. Talking about the successful trials of the On-Board system, he stated that "our trial run of 350 boarding found that 95% people would be able to catch the bus." Recalling the phenomenal success, he explained that prior to the On Board System, finding the route number of approaching bus was very difficult for visually-challenged people. They needed assistance to reach the entry gate–which is indeed a great problem in developing countries like India with very unorganized Bus Boarding Patterns. This Bus Identification System which gives an audio cue assists them in boarding the bus independently. A hand-held device which visually impaired people keeps with them costs approximately INR 200.

Moving forward in the session, he spoke about the next big challenge –

Education. Undoubtedly, Braille is the most popular script for the Visually Impaired, but with the popularity of digital content and the power of the internet, it became a key focus area. By working on SMA technology, Assistech in collaboration with **KritiKal Solutions** and funding partner Wellcome Trust developed an affordable Refreshable braille display that helps them to access digital content.

In accordance with the Braille System, he spoke about tactile graphics for which they are working closely with NCERT. The technology which is available in US, UK & Japan for years for a very high price, now would be accessible to Indians at just $1/10^{th}$ of that cost. Coming to an end, he said that "we are associated with Ministry of Information Technology, and various Govt. programs like Sarva Shiksha Abhiyan to scale the Assistive Technology out of IIT Delhi. We are seeking investment from the Govt., Charities & Private bodies for getting our CSR funding to touch the lives of millions of differently-abled people".

A quick look on KritiKal's contribution towards building Assistive Technology for the Visually Impaired:

On Board: Developed to make public transport more accessible & affordable for visually impaired individuals. It aids the user in identifying the bus-route number & enables them to board the correct bus by taking the help of auditory cues from the entrance of the bus.

Refreshable Braille Display: Refreshable Braille Display (RBD) is a powerful system, used for displaying characters, typically by means of round-tipped pins raised through holes in a flat surface. As a technology partner of this state-of-the-art ideation based on shape memory alloy (SMA), KritiKal Solutions drew its revolutionary expertise on embedded software and hardware to successfully design, develop and importantly cut down the cost to almost $1/10^{th}$ of the high-end Refreshable Braille Displays.

About KritiKal

KritiKal Solutions is a technology design house specializing in Product Development, R&D and Innovation. We have partnered with over 250 clients from all over the world and helped them translate ideas into products. We have done this using our deep domain know-how and technology expertise in Computer Vision & Image Processing (Analytics), Embedded Systems & IoT and, High-performance Mobile, Web & Software Applications. In the last 15 years, we have contributed to 50+ Innovations/Products in domains like Automotive, Health & Wellness, Energy, Consumer Electronics, Wearables and Traffic/City Surveillance.