



# Assistive Technology Development in India – A perspective



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**MindTree**

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## **The problem:**

India is home to a large population of people with disabilities. The ratio of disability is high due to contributing factors such as extreme poverty, low sanitation, low nutrition, inadequate access to health care and low literacy.

Due to these factors, almost three quarters of India's disabled live in rural areas. This compounds the problem. People with disabilities living in rural areas lack access to trained care givers and to agencies that can train and help them overcome their disabilities to become productive members of their families.

Assistive technologies are still a novelty even within the urban disabled. The few technologies that are available are not easily affordable, nor are they widely sold and supported. A few technologies are actively disseminated by the respective nodal organizations – for example, screen reading software by National Association for the Blind and hearing aids by Ali Yavar Jung Institute for hearing handicapped. These are mostly offered at discounted rates to make them affordable.

There are also state run financing programs such as ADIP – Assistance to Disabled persons for purchase/fitting of assistive devices. However, many available technologies are completely out of reach w.r.to these assistance schemes, limiting the devices to the low end of the spectrum. Due to the unorganized nature of these populations, most don't have access to bank accounts and loans, leave alone comprehensive medical insurance coverage to help fund purchase of relevant AT devices for them to learn skills and earn livelihoods.

## **Part of the solution - Affordable AT**

People need affordable, locally usable and accessible technology solutions that can overcome some of the challenges listed above. However, there are almost no organized sector players in this field severely restricting the large scale adoption of AT. There are a few educational institutions like IITs that have been developing next generation AT that could increase the access and productivity of a large section of this population. However, many of these have remained in the labs instead of reaching the intended audience in volumes.

## **MindTree Foundation's role**

MindTree Foundation's charter to support the cause of people with disabilities was born out this challenge. Formally launched as a not-for-profit wing of one of India's best Mid-Size IT service companies, the foundation aims to leverage on the extensive technology and leadership capabilities of the company to make significant impact in the area of AT. MindTree offers its global clients a complete range of services in product engineering and enterprise IT services. (Please visit [www.mindtree.com](http://www.mindtree.com) for more details)

The Product Engineering group especially offers “Chip –to-Cloud” services – right from designing complex integrated circuits and complete equipment all the way to building portals and applications that run on mobile devices. The group also boasts of one India’s finest medical electronics design teams. This is the team that currently anchors most of the AT development activities on behalf of MindTree Foundation

### **Guiding Principles of MindTree Foundation’s AT Program:**

The key principles for AT development within MindTree are:

- a) Affordability – the intended audience is the differently abled people among the poor, the slum dwellers and the rural population. The technologies we develop should be stripped of all bells and whistles. Open source is always the first preference. Commonly available material and components to be used to avoid cost escalations. Reuse available technology to the best extent possible to avoid wasted efforts and money
- b) Applicability – the technologies should be intuitively usable by majority of the intended audience. That includes elimination of complex controls and user interfaces, localization of graphics and accents, provision of personalized recorded messages instead of synthesized content etc.
- c) Due to the nature of intended audience, the products will need to have a high level of reliability and stability. This means, even though the target costs are very low, the quality and reliability will still need to be world class. MindTree Medical electronics experience comes in quite handy here.
- d) Since there is a large inventory of AT solutions already developed as proof of concepts in the labs of IIT and other institutions, a major part of the activity will also be to take these solutions, make them conform to industrial strength and use the existing network of partners to manufacture, distribute and support these technologies to a larger audience. We will also collaborate with partners in the NGO/care giver sectors in the need identification, product validation and information dissemination processes.

### **Progress till now:**

In the past 6 months of full-fledged operation of the foundation has considered 21 different AT initiatives. Of these 14 have moved beyond the initial evaluation and are in various stages of analysis and development.

Some early successes are highlighted below:

- 1) ADITI – (Analog Digital Theremin Interface) – This is a non-tactile switch that can substitute very effectively for a commonly used jelly bean switch. Instead of pressing the plunger, the device detects any motion close to the plate and creates a click. The advantage of this device is that it can be set close to ANY movable part of the body – Head, leg, elbow etc. This product was built at IIT Chennai few years



ago, but still remains a lab product. MindTree team has taken this product, cleaned up the documentation, built a pilot run and delivered to an NGO. Now we are talking to a vendor to manufacture volumes, to benefit a much larger population.

- 2) Portable Wearable Input Apparatus (Mitten switch): This solution was our first answer to the access issues of a child at the **Spastics Society of Karnataka** (SSK) with severe cerebral palsy. Since it was just impossible for her to reach out and operate any type of input device, we decided to bring the input device to her hand. This has opened up a new world for her. Since 5 switches were found to be too many, we have refined this to a single switch interface which now has a more universal application among the children at SSK.



- 3) AAC Device – By far our most ambitious venture till now. This product the functionalities of a full-fledged AAC, with touch screen LCD, switches, speakers, AT software etc . The technology is already proven on an existing telemedicine platform which will be reused for this device in a new form factor.



will provide

### **Opportunities:**

These early successes have given us the confidence that we have a viable role in strengthening this eco-system to enable large scale adoption of AT. Our non-profit structure, industrial design expertise of MindTree Limited and our clearly articulated charters have been helpful in creating a high level of acceptance and credibility within the academic institutions and NGOs. This level of partnership is important for this initiative to succeed in the long run.

Based on the successes within the local network, we now have the platform to explore engagement with organizations like PACER in the process of AT development and deployment as we go forward. This will help us to assimilate the global knowledge and expertise to further strengthen the solutions and processes.

### **Challenges:**

While we have made significant progress, key challenges still remain. The biggest among them is to establish the process for the sales, distribution and support of AT within the target audience in a reliable and sustainable way. There are also issues related to certification and standardization as we attempt to broad base the production of the AT products. As we move forward in this journey, we aim to address these issues with the collective support of our ecosystem partners.