ANNIE
INDIA'S FIRST BRAILLE LITERACY DEVICE FOR THE VISUALLY IMPAIRED

JHARKHAND

Braille literacy rate in India is less than one percent. This is due to the fact that pedagogy of Braille requires constant presence of a teacher who is often not available. Secondly, there is hardly any interactive content available for Braille learners. Acute shortage of special educators compounds the problem further. With a major part of available resources going towards meeting other needs, hiring and training more teachers is often a financially challenging and logistically time consuming exercise.

As its contribution to the national goal of creating an inclusive education ecosystem in the country, Ranchi District Administration reached out to collaborate with Thinker-Bell Labs, a BITS-Pilani Start-up. Thinker-Bell Labs has developed a device named "Annie" which is India's first Braille literacy device for the visually impaired.

Annie enables students with visual impairment to self-learn Braille in a funfilled and engaging manner. All hardware modules of Annie are designed and customized to teach Braille in English as well as Hindi language. It comes with pre-loaded interactive content designed by curriculum experts and teachers. The software ecosystem around Annie allows for tracking the student progress (analytics) and downloading of new content on to the device. The Annie learning ecosystem triggers a multiplier impact on the problem by allowing one special educator to teach and monitor several students at the same time.

HOW DOES THE DEVICE WORK?
- Annie is a standalone device. Once switched on, a human-voiced audio guides the user to navigate through interactive learning content such as lessons, games, exercises etc. The content has been specially put together in Hindi incorporating local folk tales and similar other contextually familiar content to better engage the students.
- The user just needs to follow Annie's instructions via the earphones, or speakers, to engage with the interactive and adaptive content to learn Braille at his/her own pace.
- Inputs from the user are taken via the ergonomically designed Braille keys (for typing) and a specially developed digital Braille slate (for writing). There are two refreshable Braille displays for reading. One display showcases the letters with larger dots for beginners while the other has standard sized dots for words to be read simultaneously.

- INCLUSIVE EDUCATION FOR VISUALLY IMPAIRED.

KEY FEATURES
- STANDALONE, UNIVERSAL AND REGION-AGNOSTIC DEVICE.
- INDIA'S FIRST BRAILLE LITERACY DEVICE.
- INSTANT CORRECT FEEDBACK.
- CONTINUOUSLY MONITORED, ANALYSED, AND VISUALISED ON DASHBOARDS.

- The users get an instant corrective feedback when they punch in an answer. The users do not need to depend on the availability of teacher's personal time to correct the mistakes that may have been made by them.
- Annie is a universal, region-agnostic device. The users can learn Braille of any language in any medium of instruction. Once the users learn to read, write, and type Braille on Annie, they can do all of that on any other standard instrument.
- Teachers can control content on the Annie devices being used by their students. Similar to a normal classroom with a blackboard, one teacher can supervise all children using Annie devices at the same time, without the compulsion of relying on an individual's attention.
- Annie is a device with internet connectivity. The user's data can be continuously monitored, analysed, and visualised on dashboards that help teachers & other stakeholders (such as parents) track performance and usage. The users can also access and download fresh content into Annie as and when required.

Leveraging innovative technologies for serving the targeted beneficiaries can be successful only if the technology can adapt itself to the location specific needs of the beneficiaries. This effort of the Ranchi District Administration at the Government Blind School, at Harmu in Ranchi (where a smart classroom was installed for the first time in India in July 2018 through the District Innovation Fund) has demonstrated that success can be achieved in Braille teaching through an adaptive technology and an inclusive approach.

PROJECT OUTCOMES
Since the installation of the smart classroom, a total of 154 days of usage has been recorded by 24 users in the Government Blind School that has a strength of 35 visually challenged students. A total of 985 sessions of student activity have been recorded since commencement of the project. This amounts to an average of 6 hours of daily usage by children where an average session lasts more than 30 minutes. A total of 485 hours of content has already been delivered to each user.

The improvement in learning outcomes can be attributed to the devices installed under the project. Reading and typing lessons have been delivered 1083 times by each student since deployment. Writing proficiency related lessons have been delivered 239 times since deployment. Vocabulary building exercises in Hindi and English (dictation tests) of varying degrees of difficulty were released on September 15th, 2018 in the form of a new content pack. These exercises have been done 136 times by students in 15 days that the devices have been in use. Competitive Braille proficiency building game of various difficulties was released on October 5th, 2018 as a new content pack. Since then they have been used 423 times in 9 days by 24 students who are using the devices. The Competitive Braille proficiency building has received a very encouraging response and has led to a significant increase in student engagement with the device. This has a direct and positive impact on their Braille reading and typing speed and accuracy, along with vocabulary.

WAY FORWARD
It is planned to equip all 24 Districts in Jharkhand with Annie enabled smart classrooms for students with disabilities. This will be a major step in the direction of addressing the inadequacies of pedagogical infrastructure needed for Braille learning.●