CASE REPORT

Strengthening Ecosystem for Assistive Technology

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INTRODUCTION

This report reflects on some of the initiatives undertaken by the International Committee of the Red Cross (ICRC) to contribute to strengthen the ecosystem of assistive technology (AT) by promoting innovation, building partnerships, and prioritizing user-centered approach. The ICRC focused on strengthening national rehabilitation systems, involving end-users in product development, and fostering an environment for sustainable provision of AT. Access to AT has an indispensable role in nurturing a more inclusive society.

About the ICRC

Established in 1863, the ICRC is an impartial, neutral and independent organization ensuring humanitarian protection and assistance to people affected by situations of humanitarian concerns. The ICRC's Physical Rehabilitation Programme (PRP) was established in 1979. Since then, it has diversified and expanded throughout the world: the scope of its activities has grown; it has developed its own in-house technology; and its expertise and long- term commitment to supporting physical rehabilitation services and advancing the social inclusion of people with disabilities (PwDs). Providing physical rehabilitation and social inclusion services together makes for a comprehensive approach, one that enables the PRP to be more effective in fully rehabilitating PwDs and integrating them into society. The PRP seeks to support a multidisciplinary, and person- and system-centered, approach to physical rehabilitation, with a view to ensuring high-quality, equitably accessible and sustainable services including provision of appropriate assistive devices and promoting full participation in society for PwDs.

Initiatives strengthening the AT ecosystem

Enable Makeathon (EM)1**:** Initiated by the ICRC and Global Disability Inclusion Hub, the 'Enable Makeathon' was a global project aimed at creating new assistive devices and solutions for persons with disabilities (PwDs) living in rural settings – both in India and across the world. For the ICRC, India was a natural choice because of abundance of talent and resourcefulness in generating low-cost, high-quality "innovations" for end-users. This also led to emergence of new ideas and products.

The initiative brought together innovators, engineers, and end-users to co-create solutions. The ICRC spearheaded this social movement to crowd-source innovative, affordable AT solutions for PwDs, particularly those in rural areas. It emphasized user-centered design by pairing innovators with PwDs to gain practical insights.

Enable Makeathon 1.0

Enable Makeathon 1.0, took place in Bengaluru, India. The 60-day programme from mid-November 2015 to mid-January 2016, focused on developing solutions for persons with physical disabilities living in rural India for improving individual autonomy, improving the access to and quality of physical rehabilitation services and adapting and using new technologies in a more effective manner. Out of the 186 applications submitted, 31 teams came together – 16 from across the globe and 15 on-site. There were three themes for the programme: Improving individual autonomy, access to and quality of physical rehabilitation services, and the open challenge. Out of these three overarching themes, nine challenges emerged:

- Performing activities of daily living
- Mobility in and around the house
- Mobility within and beyond the community
- Assisting education and training
- Employability and self-employment
- Remote access to physical rehabilitation services
- Remote follow-up and user-to-service provider interactions
- Data collection to improve quality of service
- Adaption and use of new technologies

The programme also included Immersion Day for teams where in the concept and context was introduced. This was followed by Business Bootcamp, with Indian Institute of Management (IIM) Bangalore, which sensitized teams to various business practices culminating at Demo Day, which was an opportunity for the finalists to showcase innovations in the context of the prototype's intended use. Seventeen teams participated in the event in the following categories: online teams, indoor/outdoor mobility, prosthetics/analysis and aids for daily living and employability.

Team Mobility India was the winner of the EM 1.0 by demonstrating a low cost, prefabricated twin device to help correct the posture of children with cerebral palsy. Team Aseem was placed second from R2D2 lab of IIT Chennai, who developed an add-on to a manual wheelchair to convert it into an outdoor mobility device while Team The RightFit Prosthetics was placed third for improving the quality of prosthetic care around the globe through a patient-centered design to help people regain mobility and independence.

Enable Makeathon 2.0

Enable Makeathon 2.0 focused on two broad themes: Accessibility and Employability aiming at Base of the Pyramid (BoP) disability population. It expanded the disability groups to include persons who are deaf and hard of hearing and persons who are blind or have low vision. EM 2.0 was an intensive innovation programme, a process similar to EM 1.0, which took place from November 2017 to January 2018 – 90 days programme. There were 12 challenges identified revolving around the themes – Accessibility and Employment:

- Access to Transport
- Access to Communication
- Maintaining Intimate Hygiene
- Access to Education
- Accessibility and Safety of Physical Structures
- Accessible Tourism
- Access to Information and Entertainment
- Access to Toilet (Public and Residential Space)
- Access to Rehabilitation and Counselling Services
- Finding Personal Caregiver
- Employability in Mainstream Profession
- Low-cost Lightweight Wheelchairs

After receiving 100 entries, the Demo Day of the EM Challenge saw *nine teams* from India and around the world demonstrating their innovative solutions to address the needs of persons with disabilities in low resource environments. The ICRC enabled innovators to translate their ideas into action by accompanying teams with fresh ideas from the ideation phase to the impact phase. Innovators benefitted from an intensive co-creation camp with mentors, experts and makers to develop a solid business plan and prototypes. EM co-creation camps and incubation took place in

two simultaneous locations; Bengaluru, India - hosted by the ICRC, and London, UK - hosted by the Global Disability Innovation Hub and University College London.

Team Bleetech with their solution on low-cost encyclopedia for persons who are deaf and hard of hearing won EM 2.0. With this technology, persons with hearing impairment can ask questions in sign language using their phones and receive responses. Team GameAble from UK came second for gesture recognition-based control software that provides access to persons with disabilities enabling them to play video games like their peers, while Team Nonspec from USA emerged third for developing a rapidly adjustable below the knee prosthetic system that is dynamic, affordable, lightweight.

Sustainable Provisioning of Assistive Technology in India

The ICRC's PRP India (2) contributed to finalizing National List of Essential Assistive Products (NLEAP) along with other stakeholders, led by the Indian Council of Medical Research (ICMR), through shortlisting the 50 top assistive devices down to 21. The ICRC contributed in production of the reference document (NLEAP) which was launched by the ICMR in September 2023.

Also, in partnership with ICMR, the ICRC co-organized the National Conferences on Sustainable Provision of Assistive Technology (NConSPAT) in 2023 and 2024. These forums facilitated exchange of knowledge and expertise, best practices, and experience among high-level stakeholders from the ministries, international organizations, national institutions, academia, research institutions, start-ups, NGOs and others who were part of a series of panel discussions. The conference highlighted the significance of establishing a sustainable ecosystem for AT in India that bridges the gap between demand and supply, driven by innovation, inclusivity, and inter-sectoral collaboration. This initiative outlined a roadmap to enhance access to essential assistive products for individuals with functional impairments.

CONCLUSION

The ICRC's approach to innovation through Enable Makeathon's was "user-centric" focusing on the needs of affected populations and involving assistive technology users in developing solutions. This principle guided its innovation strategy for improving assistance and protection in humanitarian contexts in challenging environments. These intensive accelerated innovation programmes aimed to set the focus on innovation with and by PwDs. These initiatives brought together the skills and knowledge of a diverse set of individuals and institutions i.e. humanitarians, start-ups, engineers, academics, and businesses, all committed to enable inclusion of people with disability. The ICRC worked with Partners and teams of innovators to develop new processes, products and services to the market for PwDs at the bottom-of the pyramid. EMs led to identification of challenges which required broader systemic strengthening approach to enable accessible, affordable, service-user centric assistive products and services for persons with functional impairments.

The ongoing collaboration with the ICMR gave the opportunity to address these challenges at the appropriate forums to influence the relevant stakeholders. Consequently, collaborative events with ICMR; NConSPAT in 2023 and 2024, facilitated multi-sectoral dialogue to address systemic challenges such as affordability, quality control, manufacturing and distribution of AT. The challenges for a budding innovator/AT start-up were integrated during the relevant panel discussions among key stakeholders. The goal is to create a more sustainable AT ecosystem by aligning with government initiatives and promoting universal access to quality products.

The ICRC continues to collaborate proactively with stake holders for contributing in developing systems for sustainable provision of AT in India aligning with various government initiatives such as `Make in India´ and '*Viksit Bharat*'.

Authors Contribution

Charu Sharma: Conceptualizing the scope, synthesizing findings, and writing/revising the manuscript. Zeon De Wet: Review and contribution to the manuscript.

Conflict of Interest

There are no conflicts of interest.

Declaration Of Generative AI And AI Assisted Technologies In The Writing Process

No use of AI in this case report.

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