



ICRC

# ENABLE **makeathon**

IDEATION TO IMPACT

## DEMO DAY MAKER TEAMS

[www.enablemakeathon.org](http://www.enablemakeathon.org)

**9** CHALLENGES  
**60** DAYS  
**50,000+** US\$

### PARTNERS





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## WHY THE ENABLE MAKEATHON?

The ICRC supports a large number of persons with disabilities across the world and has active Physical Rehabilitation Programmes in more than 28 countries. Most of these people – men, women as well as and most unfortunately, thousands of children – are in rural areas and from less privileged communities. The ICRC's support and assistance helps many of them cope with their daily challenges and live a life of dignity. The need to promote sustainable and affordable solutions for persons with disabilities is therefore at the heart and soul of the Enable Makeathon.

## WHAT IS IT ABOUT?

The Enable Makeathon aims at forming an ecosystem of partnerships with corporates (especially technology and medical companies), impact investment firms, social enterprises, not-for-profits, academic and public policy institutions, students, designers as well as the Indian authorities and various State Governments to prototype devices that will address physical disabilities in rural India and around the world.

The solutions developed will take the form of early prototypes that effectively illustrate the functionality and potential look of a product, proving that the theory behind the idea actually works. To ensure that the early prototypes can make it to the next level, i.e. be developed further and mass produced for customers, the ICRC along with its partners is reaching out to companies, manufacturers and investors to be part of the process.


## WHO ARE THE ORGANIZERS?

This is a collaborative initiative of the ICRC and several partner institutions, including the Association of People with Disability India (APD), Workbench Projects, IoTBLR Foundation for Pervasive Computing, Swissnex India, Dalberg Global Development Advisors, the Indian Institute of Management (IIM) Bangalore and the Indian Institute of Technology (IIT) Madras.

The Makeathon has also been envisioned as the launching pad for the creation of the latest generation of devices that can be deployed globally by the ICRC and other players to address the needs and issues of beneficiaries affected by locomotor disabilities, while making these same instruments affordable for the 'bottom-of-the-pyramid' demographic worldwide.

## GOAL AND PURPOSE

The Enable Makeathon has at its heart intention not just to innovate for new solutions for persons with disabilities (PWDs) but to draw together institutions, individuals and companies to invest in the prototypes. This additional investment is essential to further develop, test, and complete regulatory certification to turn prototypes into marketable products. The final goal is to market these products in India and overseas so that PWDs are able to access and afford assistive devices that enable them to integrate into all aspects of life.



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Focused prototype development with the guidance of mentors and experts

## THE SOLUTION MAKERS

The 60-day programme taking place between November 2015 and January 2016 is composed of an 'Online Track' for teams from all around the world and an 'Onsite Track' with a series of events in Bengaluru, India. Teams will work towards finding innovative solutions to nine challenges that would ultimately result in one or all of the following desired results:

- Improving individual autonomy of persons with physical disabilities
- Improving the access to and quality of physical rehabilitation services
- Adapting and using new technologies in a more effective manner

Discover below the different teams and what they are trying to achieve while also addressing the challenges of Enable Makeathon.

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## ONSITE TEAMS (Bengaluru)



Team **Aseem** from R2D2 Lab of IIT Madras comprises of Swostik, Ashish and Vivek. The team has developed a solution, a quick and easy add-on to a manual wheelchair to convert it to an outdoor mobility device. The attachment is available in both manual (hand cycle) and motorized mode to meet the needs of different users. They have also developed a simple mechanism to make the wheelchair compact and thereby usable in confined spaces.



Riyaz H, Soikat Ghosh Moulic, Trivikram, Indra Sena Reddy and Shiva Kumar from Bengaluru make up the **Mobility India** team. They are working towards designing an 'off the shelf' product - a low cost, prefabricated - twin device to help correct the posture for children with cerebral palsy. It has customization/adjustable features, hence the product grows as the child grows. The Unique Selling Point (USP) of the device designed is that the same product can act as both a sitting chair and a standing frame and is also cost effective and needs very little space.





The team **Bionics Without Borders** (Wevolver, London) comprises of Cameron Norris and Charlie Ann Vine from London, United Kingdom and Abhit Kumar from New Delhi. The team seeks to provide people from disadvantaged communities across the globe access to functional, hygienic and environmentally friendly prosthetic devices that can be locally maintained and locally manufactured without the reliance on highly trained technicians. The goal is to create an open source electric powered prosthesis that has a genuine functional benefit for its users. The device uses the internationally recognised DASH evaluation criteria as a measure of success.



Nekram Upadhyay from New Delhi from the team **NekDesigns** (previously titled as ISICAT). His proposal is to come up with an innovative set of Assistive Devices for persons with very limited hand movements who find difficulty in pointing, holding, gripping objects. Nekram has developed the MAK (My Ability Kit) which is a set of Assistive Devices to perform activities of daily living independently like feeding or eating, drinking, brushing teeth, shaving, combing, writing, typing on keyboard or touch pad screen. MAK is modular and unique in design. It could be carried packed in a small box. It could be developed in three sizes small, medium and large from special kids to elderly with limited hand control. Main key factors of MAK are modular design, low-tech, cost effective.



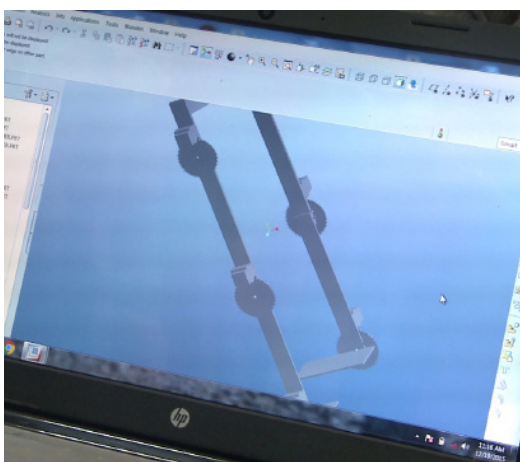
Team **DOST** from Chennai comprises of Jayavel, Sakthivel, and Kothandaraman from the Centre for Rehabilitation Engineering and Assistive Technology at IIT Madras. The idea is to design a universal powered detachable device that will act as an add-on to a manual wheelchair. The concept looks at providing independent mobility for a wheelchair driven in all terrains. The plug and navigate feature of this powered device greatly enhances the mobility of the disabled individual and this device can be bought and placed in the offices of corporate houses, government agencies and multiplex shopping malls so that the disabled person can use it for navigation in the premises of the host institutions.



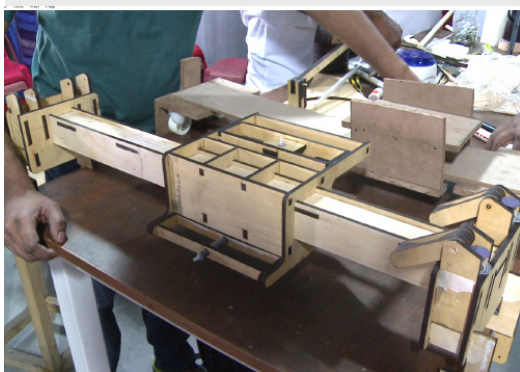
Team **KAFO Design** comprises of Ganesh Bapat, Muthu Visvashwaran, Mohan Varma (IIT Madras) and Soikat Ghosh (Mobility India). The team is working on the design of the knee joint and the overall revamping of a conventional knee ankle foot orthosis (KAFO). The new locked knee joint designed by the team is highly cost-effective. It solves problems faced by many KAFO users such as the tearing of trousers due to the knee joint and the droplock getting stuck in clothes. Ease of locking and unlocking the knee joint enables users to travel comfortably in public or private transport. The team is also working on the design of semi-flexion knee joint that provides three modes of operation (free; controlled stance phase knee flexion; locked) to maintain different body postures while performing various activities of daily living.



Naidhroven A, Founder/CEO, **Nappinnai** is a team from Chennai, working on an electric mobility scooter that could be operated by PWDs without anyone's assistance for traveling within and beyond the community. These scooters, categorized as "trike" by the automobile industry, have a battery capacity that functions for nearly 50km. Equipped with state of the art electronic sensors for maintaining balance, the scooters have been ergonomically designed to be the safest 3-wheeler on the road. Seats with removable hand rests and 360 degrees swivel action, make it easier for the person to shift onto the scooter without much trouble. It also provides additional support attachments that allows the user to carry their wheelchair with them thus ensuring that their last mile mobility device is always available.



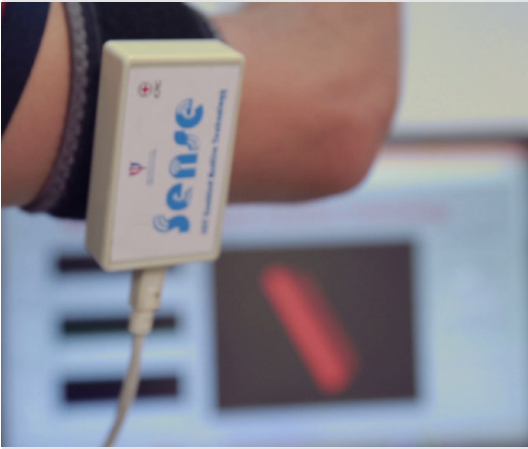
From Nagpur comes the team **Project Lincoln**. The team comprises of entrepreneurs Abhijeet Khandagale, Tashwin Khurana, Rahul Patil Borse, Laxman Ingale and Parag Bagde. The team is looking at developing an assistive exoskeleton for people with limb disorders. The exoskeleton simply enhances the muscle power of the user using high torque motors and helps enhance the 'walk' of the user. The exoskeleton will be controlled by measuring muscle activity by detecting its electric potential, referred to as electromyography (EMG), will be semi autonomous, initiated by the user and taken over by the machine.



**Global Hands** is the team comprising of Sridhar Srigiriraju, Smitha Murthy, Prabhu Govindarajan, Abhinav Dey and Nitin Bawsay, a multi-disciplinary team that aims to create an assistive block printing device used for the traditional art of "block printing" so that the enabled blocks can align themselves to the design on the fabric and the pressure exerted by a motor driven hammer. The uniqueness of the product is that while it helps in bringing precision to the block printing process, it does not remove the therapeutic content of using the upper limbs. The expected product is aimed at wider engagement for providing sustainable livelihoods for people affected by leprosy, burn and polio and people with other physical and intellectual disabilities.

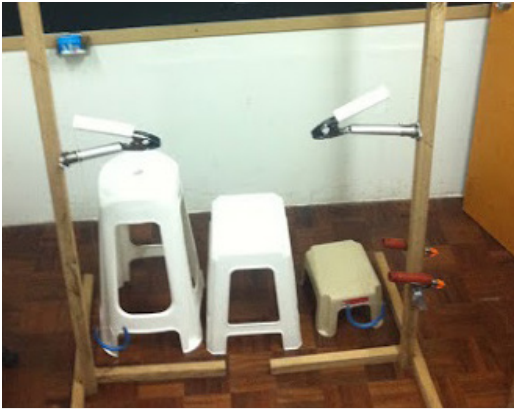


Team **Sparsh** from the host city, Bengaluru comprises Rituporna Gogoi, Hrishikesh Boruah and Anand Nagarajan as its team members. The team is designing an On-the-go Adjustable Crutch for people with disabilities and is intended to help in doing everyday tasks such as picking up a glass of water from a table to sitting on a toilet seat. It will also help a person ambulate in slanted cross slopes and uneven terrains of rural areas. The idea is to make a simple design that can be adapted to environmental as well as personal needs of people with disability.



**Sense (RBCCPS)** is a team from Bengaluru with Pranav. C. Raman, Dr. Vishnu, Prasad V.J, Dijo John Manavalan, Sai Sidhardh and Dinesh B.K as its team members. The team is looking at developing an Internet of Things(IoT) enabled assistive device that assists in understanding the user by studying and analyzing how prosthetics are used during various activities. The device would sense the comfort level of the users through various sensors and this in turn will enable prosthetists, physiotherapists and rehabilitation centers to improve the functionality of the prosthetic device for people with disabilities, the elderly and to improve the recovery rates of persons undergoing rehabilitation. It is envisioned that Sense would also detect whether the prosthetic device is worn and can infer potential behavioural causes. Future versions may include more sensors to gain further insight for causes of discomfort such as humidity or temperature of the prosthetic.

## ONLINE TEAMS (Global)



Diana Anthony, Angie MacDonald, Patrick Mathay and David Krupa of Quito, Ecuador form the **ROMP (Range of Motion Project)** team. The team is designing HandsFree Fit - an independent dressing apparatus for bilateral upper limb amputees. The device would be a fully mechanical, body-powered solution for bilateral upper-limb amputees to load and don clothing independently. The device is low-cost and can be made anywhere in the world, including rural locations. The design is open-source and available to anyone who wants to use it to improve their abilities to perform independent dressing.



Team **3DPT** is Stan Baldwin and family from Aurora, CO USA. He has already developed Assistive Tech handles to help people with dexterity issues hold ordinary silverware. He is expanding on this idea by producing the Handy Writer Grips to help people including children to write. These 3D printed items can be customized to fit the user's needs. The idea is to expand on the existing handles with items for education so that Handy Writer Grips can help students complete their schoolwork and give anyone with dexterity issues the independence to write on their own.

	<p><b>GEN-2</b> by Free Wheelchair Mission Chair Description: GEN-2 was designed with adjustability in mind, allowing for a more customized fit to address each individual recipient's personal needs. Intended Users: Children and adults without postural support needs; Older adults (over 65 years old) Used In: indoor, outdoor Selling Price: \$64 USD (not including shipping or provision) ISO Testing: Email: Don Schoenfelder Website: <a href="http://www.freewheelchairmission.org">www.freewheelchairmission.org</a></p>	<p>★★★★★ Ratings #60 Share f t p</p>
	<p><b>KT-X18</b> by Ken Tuong Wheelchair Chair Description: No overview available. Intended Users: Children and adults without postural support needs Used In: outdoor Selling Price: \$180 USD (not including shipping or provision) ISO Testing: Email: Vinh Quoc Website: <a href="http://www.kentuong.net">www.kentuong.net</a></p>	<p>★★★★★ Ratings #60 Share f t p</p>

**International Society of Wheelchair Professionals** is a team from University of Pittsburgh (United States). Its team members Anand Mhatre, Sam Waters, Rachel Gartz, Sara Munera and Max Lohss are part of a student Group who are studying Rehabilitation Science & Technology and Bioengineering. They are working on constructing an information portal providing comprehensive information on wheelchairs for wheelchair users, clinicians, manufacturers and other stakeholders in the wheelchair service sector.. It is envisioned that availability of such information about WCs used in less-resourced settings through a web-based information portal will assist users in making informed choices during the WC provision process. Further, the team also aims to develop a knowledge base, tools and resources that will not only assist in service provision but also promote awareness and improvements in wheelchair design.



Team **Mariachi** comes from University of Monterrey, Mexico. Team members Andrea Giovanna Gonzalez Tavitas and Francisco Guerrero Gonzalez are trying to create an off-road wheelchair, capable of hitting hard dirt roads, made with basic and inexpensive bicycle components.



Mahmoud Tavakoli, João Luis Lourenço and Joana Pestana from University of Coimbra, Portugal make the team **Soft-Bionics**. This young team, that has expertise in soft robotics, soft electronics, grasping, mechanical design, benchmarking and electronics and control systems is trying to bring low-cost state-of-the-art soft technologies (sensors, mechanics, electronics, robotics), to many people. Their first product, is the body-actuated Soft-Hand kit for low resource areas. The kit is modular, easy to assemble and can be maintained by the patient. It is functional and benefits from an anthropomorphic appearance and soft skin with adjustable colour. While this the start point for low resource areas, the team is also working toward more advanced versions of bionic hands that embed sensor integrated soft fingers, as well as very low cost and light-weight actuation mechanisms as a future add-on to current body-actuated design.



The **RightFit Prosthetics Initiative** is dedicated to improving the quality of prosthetic care around the globe through patient-centered design to help people regain mobility and independence. The team is comprised of Gary Wall and Rochelle Dumm, two Masters students in Prosthetics and Orthotics from Georgia Institute of Technology, Atlanta, United States. The RightFit team developed the Fuji Foot – a low-cost, energy-storing prosthetic foot with multi-axial capabilities that flexes to accommodate uneven terrain yet is durable enough to withstand long treks on foot and high-impact activities. The Fuji Foot is the first design that functions like a more expensive foot but costs \$50. With this foot, individuals can use their prosthesis for longer before needing a replacement and they can be more active and independent



**Complete Wheelchair** is a team comprising of Arpit Mathur, K S Praneeth & Gaurav Paliwal from Indore, India. The team aims to design a complete wheelchair that enables the user with the ability to stand and reach objects beyond his/her reach and also easily shift to and from a bed using a system to adjust seat height. The wheelchair can be used on all terrains and has the ability to maintain different body postures thereby adding to the well being of the user. Different mechanisms such as tiltable leg, standing aid are being used in the design of this product.





Judges take a closer look at prototypes to shortlist finalists towards the end Maker Days held from 19 to 21 December 2015

**For further details**

Visit <http://www.enablemakeathon.org/> or speak to

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