EMB DAY – FIRE SIDE CHAT
IEEE P2650

5 March 2021

Mohan Kumar R
Chair, P2650 WG

SIG (Special Interest Group) – Communication Disability

SIG is a pre-standardization process through which like minded experts come together and work towards a self defined goal.

- Formed in August 2014
- 14 Members (Academic, Industry, Service Providers, User Community & Research)

- Charter is to identify technological requirements, gaps in standards & create knowledge pool through student/professional projects helping disabled community

Communication Disorders

- *An impairment in the ability to receive, send, process, and comprehend concepts or verbal, nonverbal and graphic symbol systems*
- *A communication disorder may be evident in the processes of hearing, language, and/or speech*
- *A communication disorder may range in severity from mild to profound*
- *It may be developmental or acquired*
- *Individuals may demonstrate one or any combination of the three aspects of communication disorders*
- *A communication disorder may result in a primary disability or it may be secondary to other disabilities*

Source : ASHA

SIG Mission Statement

e-Nabling *Ability* in Dis*Ability*
Through
Standards & Technology

Current Focus : Speech & Hearing, Visually Challenged, Autism

Achievements of the SIG

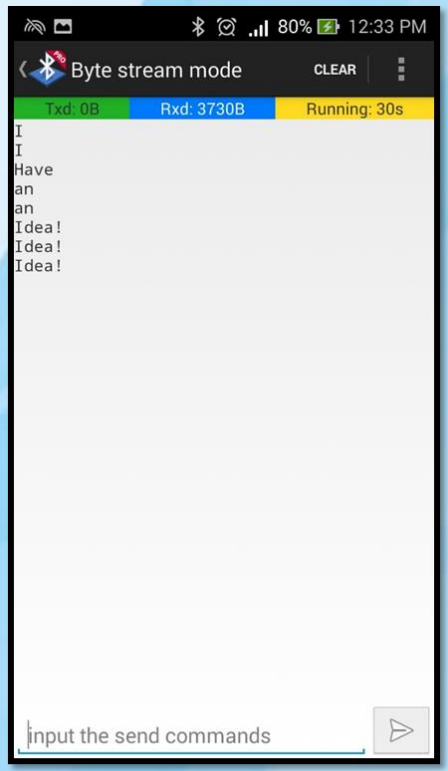
- Analyzed all the available technology for Speech & Hearing disabled community and identified gaps
  - *Pure Tone Audiometry, Oto Acoustic Emissions, ABR, etc*
  - *Sound proof chambers for testing*
  - *Rehabilitation post Cochlear Implant Surgery*
  - *Speech rehabilitation for stuttering, cleft lips, etc*

- Conducted 1st workshop on "Enabling Ability in Disability through Standards & Technology" in July 2015
  - *10 project proposals selected, 3 prototypes awarded*
  - *75 delegates participated*

Disability Workshop

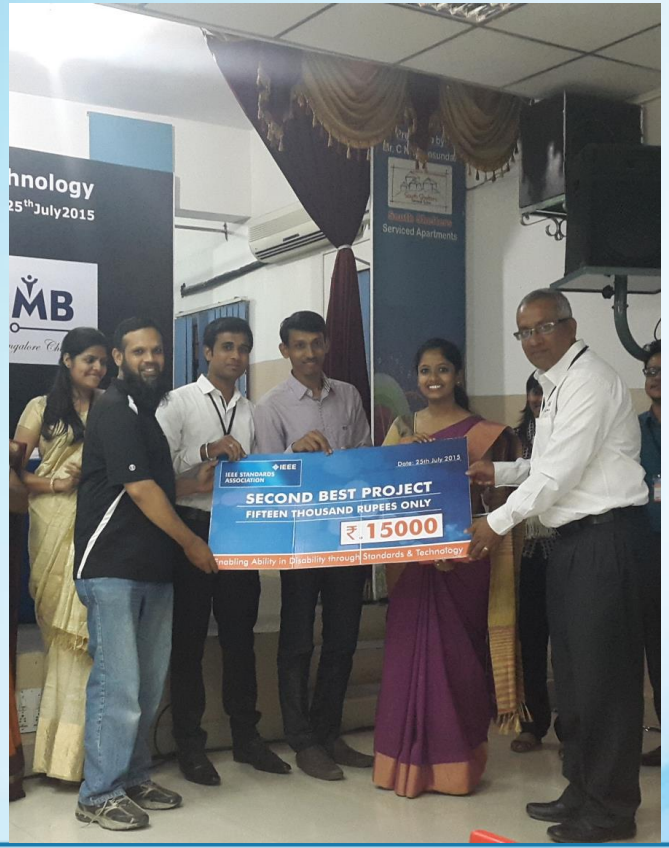
Innovations that were rewarded

SPEAK-IT Glove



Innovations that were awarded

"Audiometer" Mannequin



Kid's Toy for Rehab

Achievements of the SIG

- Approval for the Project Authorization Request (PAR)

  "Pre-Screening Audiometry Systems (P2650)"

  Technical Sponsor:

  IEEE Engineering in Medicine and Biology (EMB) Society Standards Committee

- **SignBee 2015**
  - World's 1st Ever Sign Language Contest for 'Normal' School Children

Formation of P2650 WG

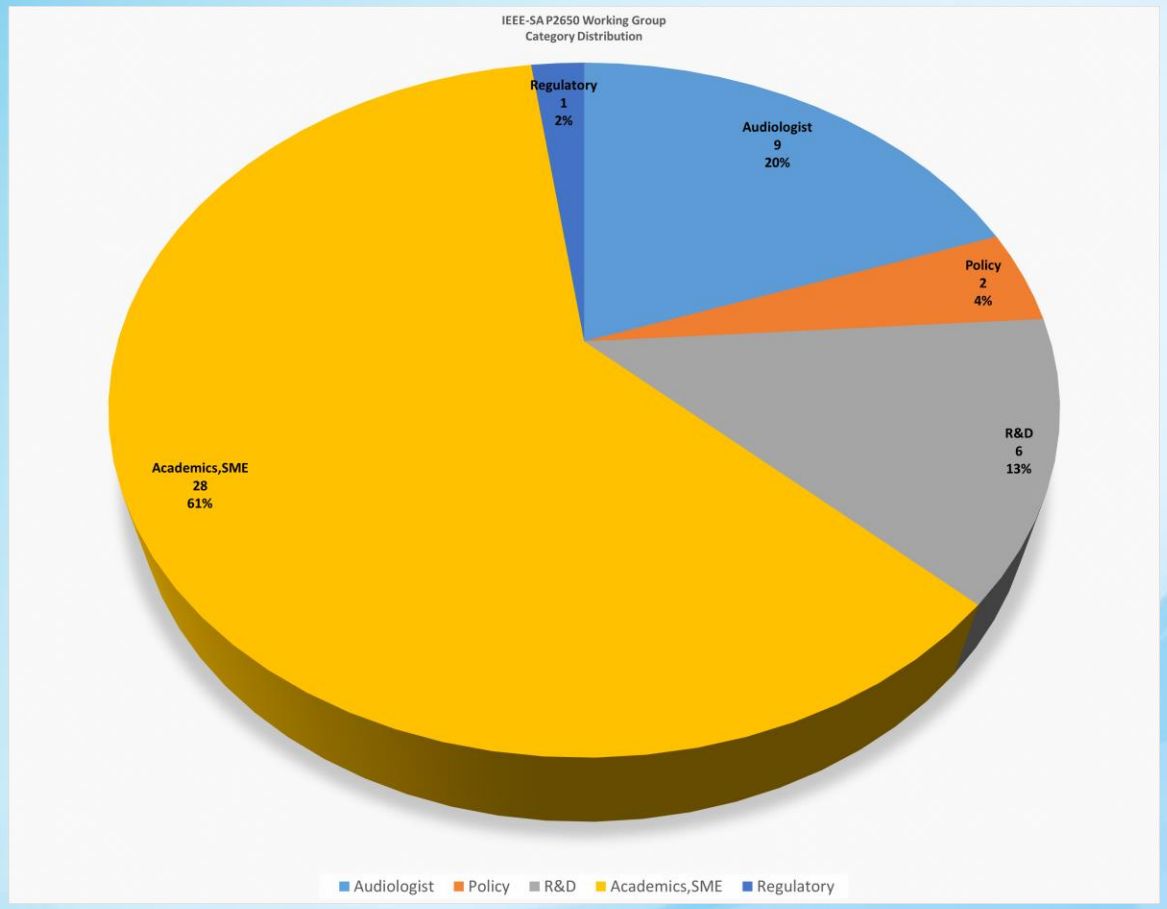
Develop an IEEE Standard For

Enabling Mobile Device Platforms

To Be Used As

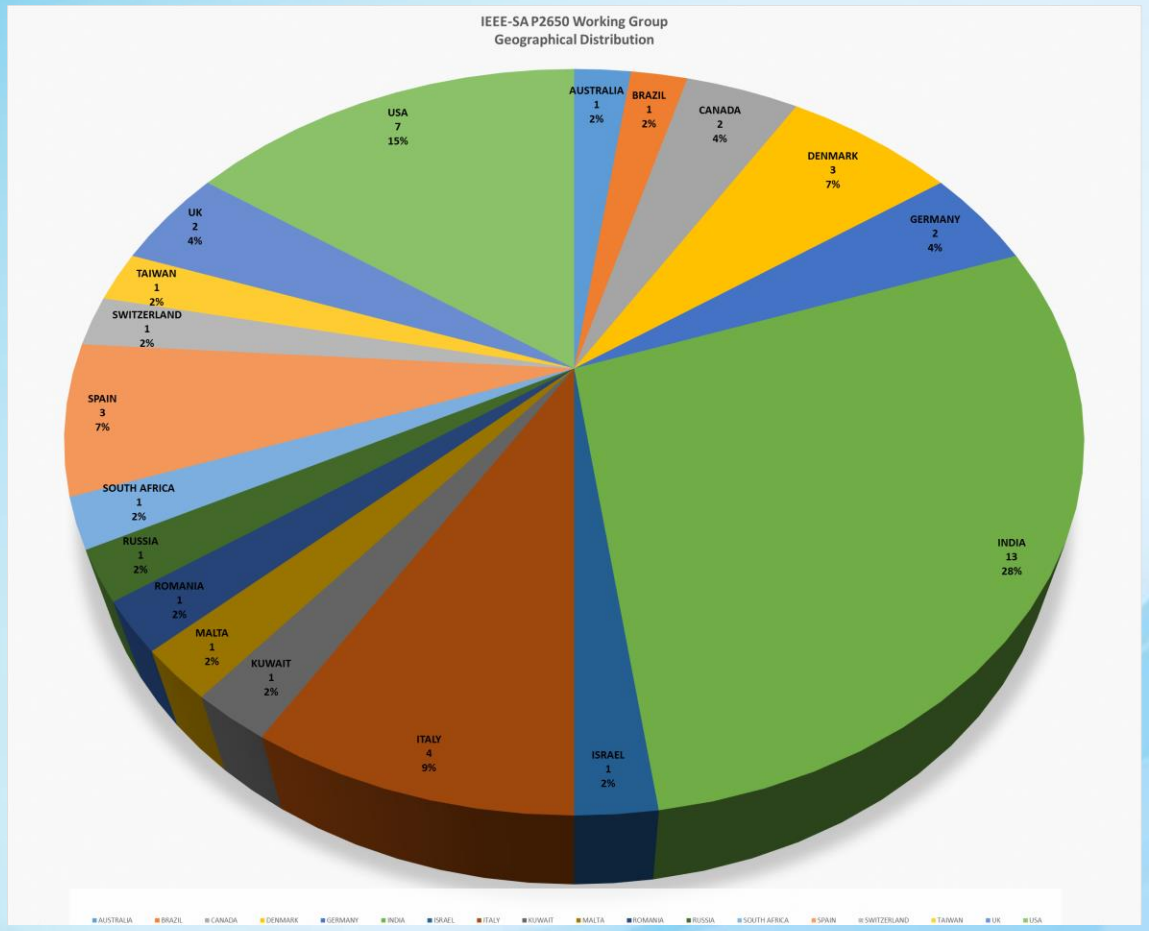
Pre-Screening Audiometric Systems

IEEE P2650 – WG Profile



- 60% SMEs
- 20 % Practicing audiologists
- Rest in R&D and Regulatory domains

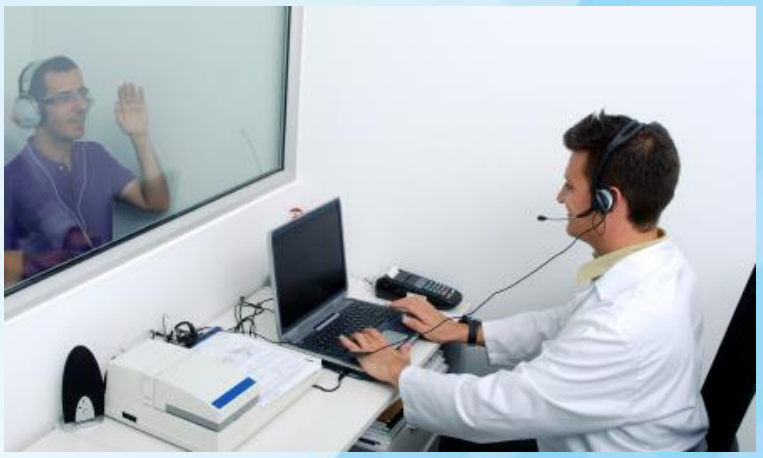
IEEE P2650 – WG Profile



Over 50 people in the WG representing 18 countries !

Current Focus of P2650 WG

Conventional Audiometry

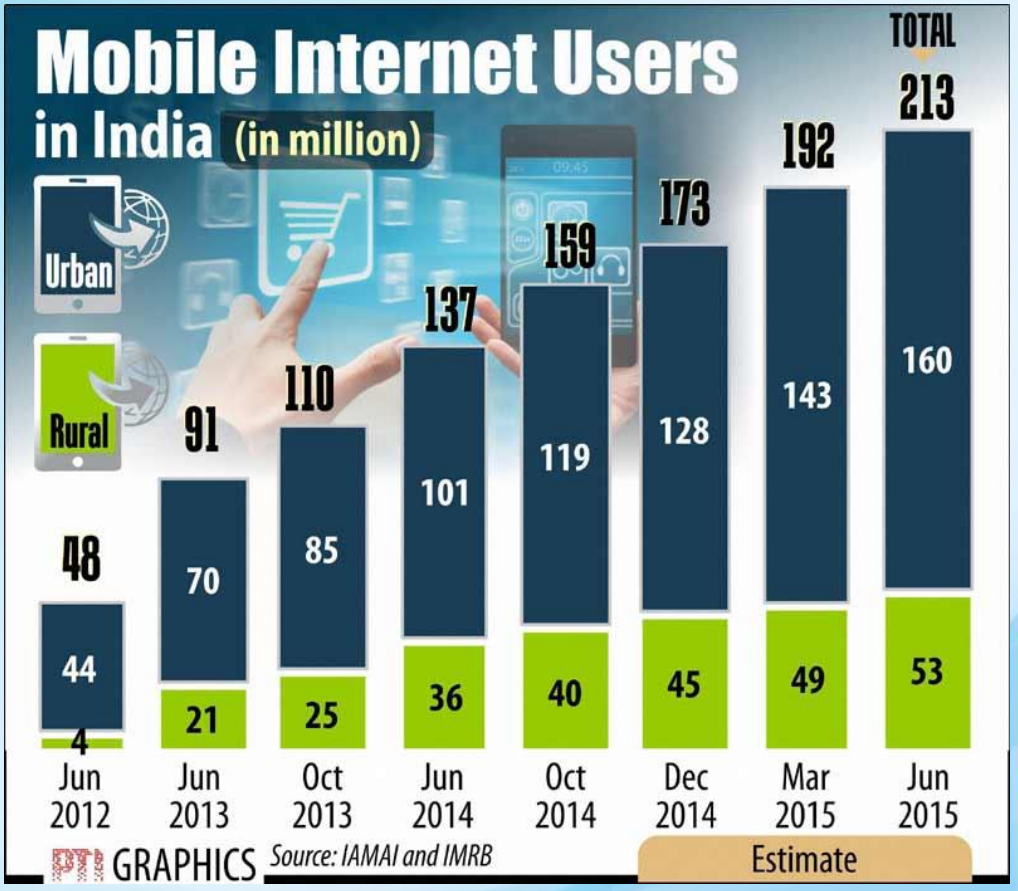


Pure Tone Audiometry (PTA)

Oto Acoustic Emissions (OAE)

Auditory Brainstem Response (ABR)

IoT Devices : Mobile Penetration



Mobile Phone Penetration in Rural Areas is increasing !!

IoT Devices

?

©sohum labs

?

?

©iHear

©uHear

IoT for PreSreening Audiometry

SCREENING

PRE-SCREENING

UNMET NEED

IEEE P2650 – The Steps

- Identify technologies that can be used for Pre-screening
  - Headphone (low cost, noise cancellation, etc)
  - Mobile/Wearables (low cost, open platforms, Apps, etc)
  - Database (cloud infrastructure, interoperability, patient management, etc)
- Identify validation studies that can be used for Pre-screening
  - Localization aspects (syllable test, speech-in-noise tests, etc)
  - Acceptance criteria and overlap with diagnostic tests
- Identify standards that can be used for Pre-screening
  - Existing standards that can be leveraged upon

IEEE P2650 - Timeline

WG Process

Jan'16 : Formation

Feb'16: Kick-off

Bi-Monthly Meetings

Draft Standard

Jan'20 : Technical

Draft ready

Clinical Validation

Current Stage

End by Jun 2021

MILESTONES

2016 - 2019

Identified Technologies that can be used for Pre-screening

- Headphone (low cost, noise cancellation, etc)
- Mobile/Wearables (low cost, open platforms, Apps, etc)
- Database (cloud infrastructure, interoperability, patient mgmnt, etc)
- Identify validation studies that can be used for Pre-screening
- Localization aspects (syllable test, speech-in-noise tests, etc)

Acceptance criteria and overlap with Current Diagnostic tests

Identify standards that can be used for Pre-screening & Existing standards that can be leveraged upon (ex: IEEE 11073 series)

Draft Standard Version 1.7 Ready for Validation
https://ieee-sa.imeetcentral.com/p/aQAAAAAD4ASt

MILESTONES (Extended PAR period)

2020 -

Validation of Android based Hearing Test Applications (Apps)
Clinical Study is being undertaken to compare the outcomes in a controlled environment that is typical of camp set up and controlled degree of simulated hearing loss in 4-5 centres – this will help refine the calibration thresholds described in the DRAFT standard

Status :

- Ethical and technical clearance obtained, Consent forms for students and patients obtained
- Proposal for project funding has been submitted to IEEE
- Study could not start off as per the project plan as participating academic institutes were temporarily closed in the wake of Covid-19 pandemic
- There is still uncertainty prevailing with regard to the reopening of academic institutes
- Plan for next course of action during a WG meeting in the mid-September

Validation Study Details

Participating Institutions

1. Dr. SRCISH, Bangalore - Lead
2. NISH, Trivandrum
3. KMC, Manipal
4. MAHE, Manipal
5. AIISH, Mysore

Open to add more Institutions – either within India or Outside

More details :
https://ieee-sa.imeetcentral.com/psas/folder/all/WzIsNzE1Mjk0ODVd/

Status :

- Ethical and technical clearance obtained from most of the Institutions
- Project to be done in 3 Phases as soon as Institutions open up post-COVID (expected Oct'2020)

P2650 enabled scenarios

hearScreen
smart solutions for hearing

SHOEBOX AUDIOMETRY

Consumer › Self-assessment › Download uHear mobile app

SHOEBO

SHOEBOX is
Audiometer. N
as compact, e
SHOEBOX is
and produces
thresholds as
can cost up to

uHear

With uHear, identify a potential hearing loss through three assessments: Hearing Sensitivity, Speech in Noise, and a Questionnaire about common listening situations.

uHear also offers a 'Locate' function to help find the nearest hearing healthcare professional for a full follow-up.

uHear is available for download to the iPhone and iPod touch

Download from iTunes

Thank You