

ITU KALEIDOSCOPE
ATLANTA 2019

Development of Hearing Technology with Safe Listening Features

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Presentation Overview

- Understanding risk and prevalence of Noise Induced Hearing Loss (NIHL)
- Description of App to address NIHL
- Continuing efforts to support WHO-ITU initiatives for safe listening

NIHL is Global Health Concern across Wide Demographic

CIVILIAN

40 M in US at risk

50% do not have noisy
jobs

20% US teens at risk

*US Center for Disease
Control (CDC)*

YOUNG ADULTS

1.1 B at risk globally
due to unsafe use of
**personal audio
devices**

*World Health
Organization (WHO)*

MILITARY

Disqualification for
battle readiness
Of concern both **on
and off duty**

*US Dept. of Defense
(DoD)*

NIHL is Painless, Progressive, Permanent... but Preventable
US DoD Hearing Center of Excellence

 Proposed App Development Flow

Realtime cumulative sound exposure vs. US and UN safe listening standards



User Voice integration



Promote safe listening habits
(guided by WHO-ITU Toolkit)

Realtime Safe Listening Exposure Assessment

Daily sound exposures (SPL in dBA) - Occupation, Lifestyle, Recreation

Realtime Computation vs . Safe Listening Standards

Audio
WHO-ITU (H.860)

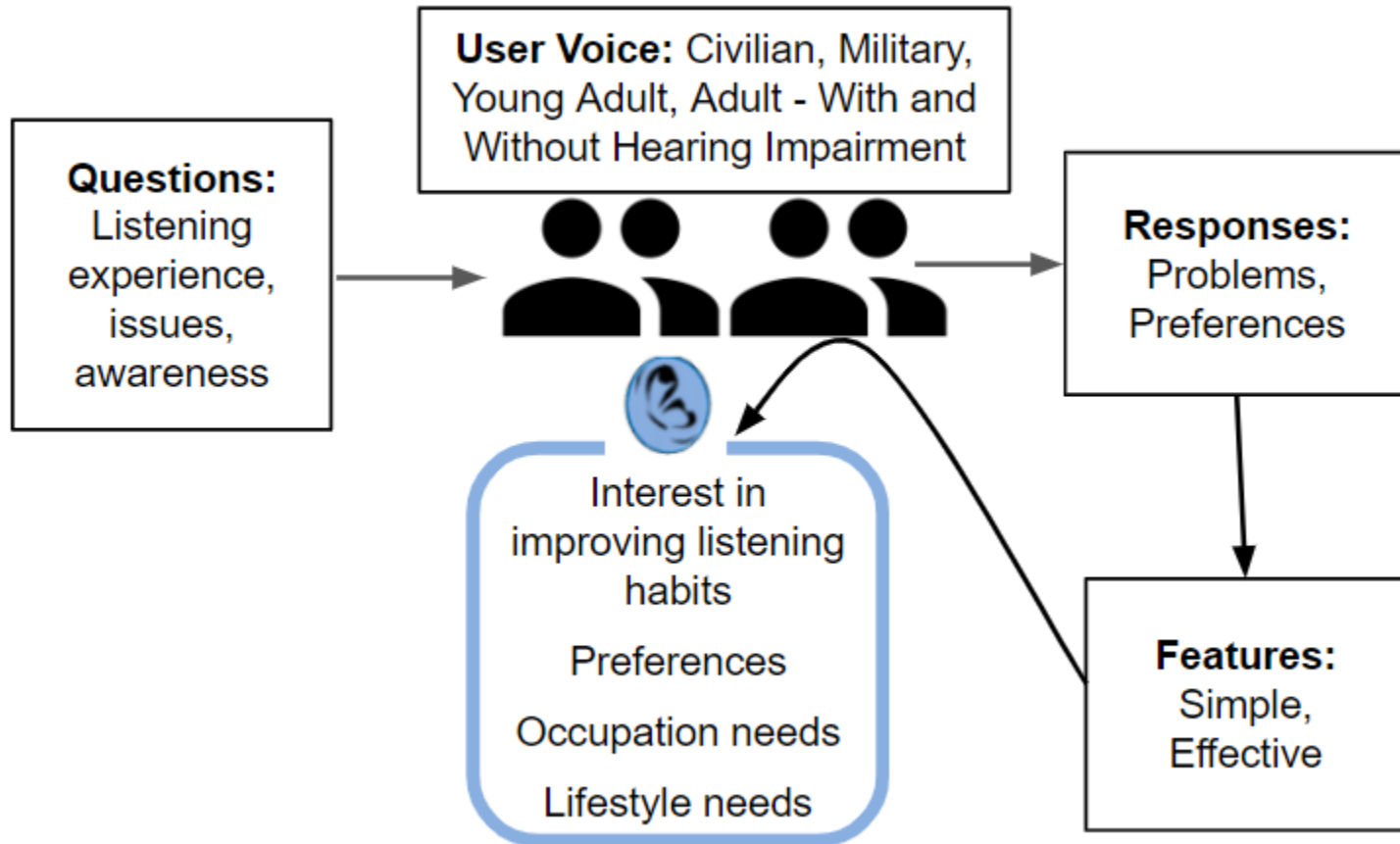
Occupational
CDC, NIOSH, OSHA

Military
ARL, APHC, HCE

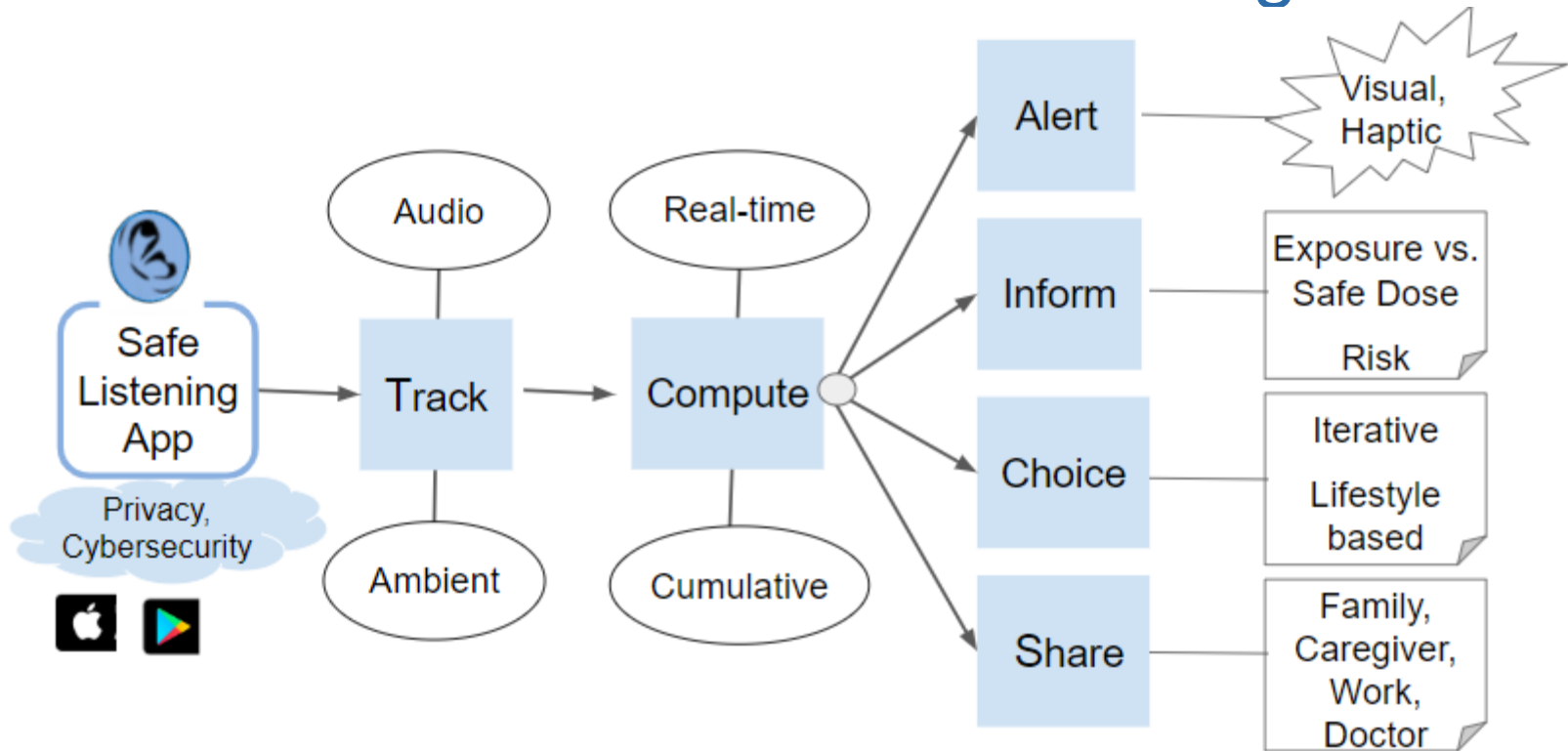
Personal Sound Exposure
vs.
Global Safe Listening Standards

NIOSH: National Institute for Occupational Safety and Health, OSHA: Occupational Safety and Health Administration, ARL: Army Research Labs, APHC: Army Public Health Center, HCE: Hearing Center of Excellence

User Voice Integration



Features to Promote Safe Listening Habits

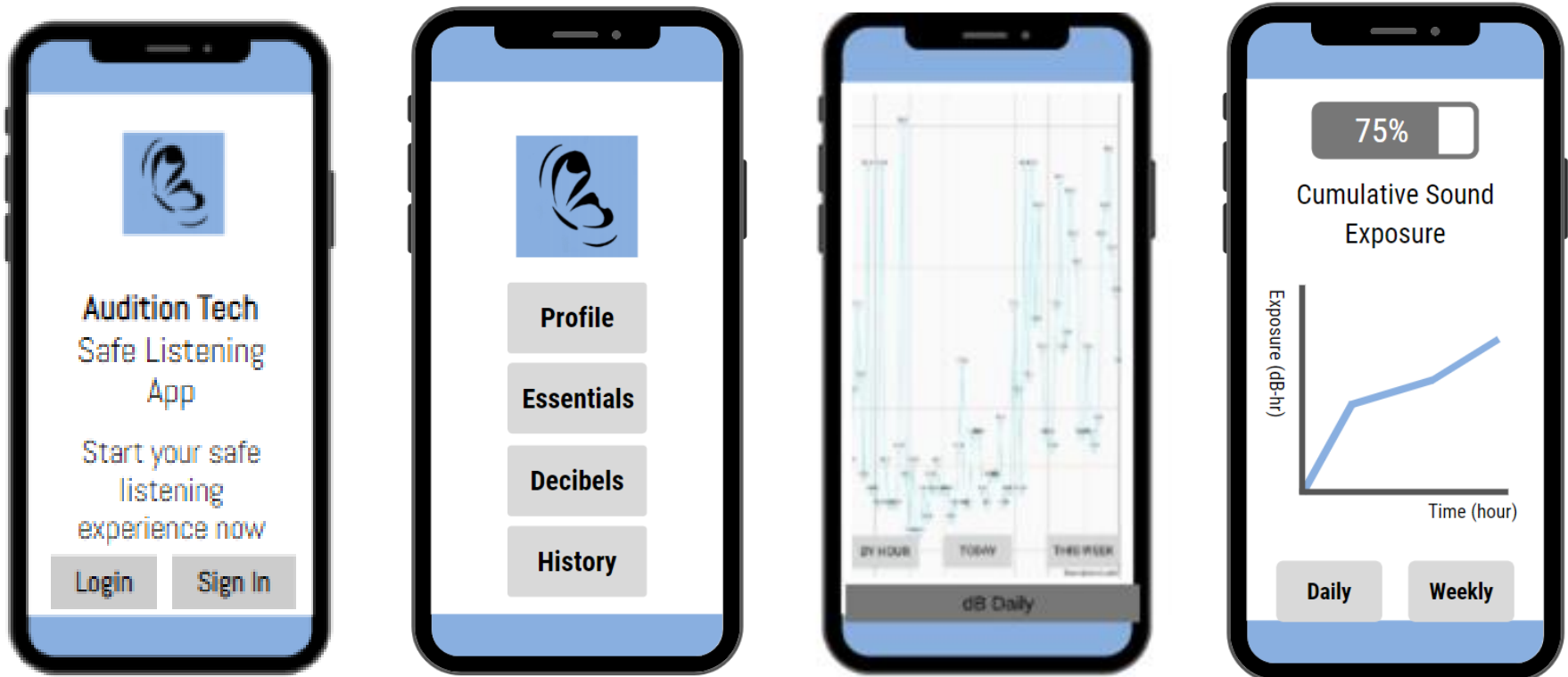


◇ Standalone

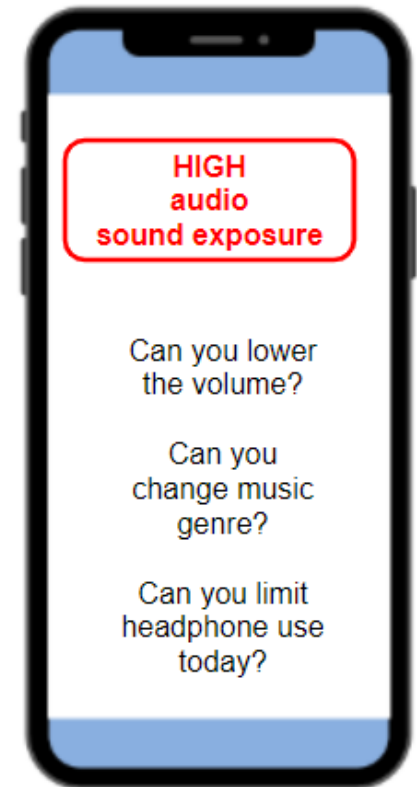
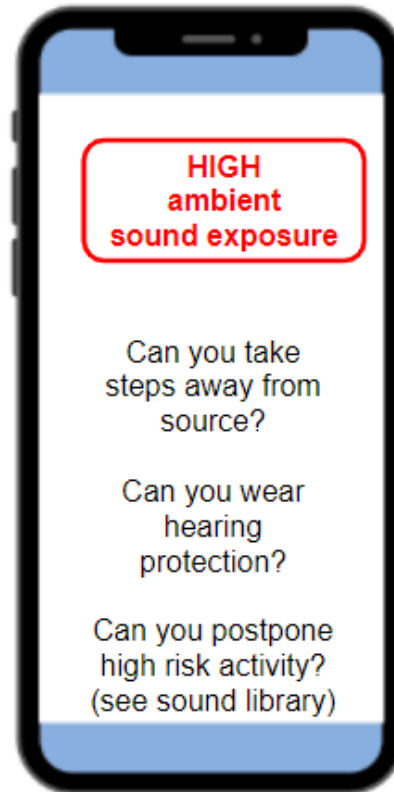
or

✳ Companion to Personal Sound Amplification System, Hearing Aid

Interfaces - Non Hearing Impaired User



Interfaces - Non Hearing Impaired User



Key Safety Considerations

Guided by WHO recommended principles of digital development and US (FDA, HHS) rules

PRIVACY

- No personal identifiers accessed, stored or shared
- Only collects amplitudes of sound in decibels and stores in secure cloud for personal exposure reports
- Sharing of personal reports decided by user

CYBERSECURITY

- Conforming to NIST (National Institute for Standard and Technology)
- Prevent unauthorized use, trusted content, data confidentiality, vigilance

Efforts to Support ITU Standard Development

Non Hearing Impaired Users

Accuracy Testing
Usability and Optimization
FDA and UN engagement
Continual learning, improvement

Hearing Impaired Users

'Council' formation
Understand needs, what matters most
User defined features

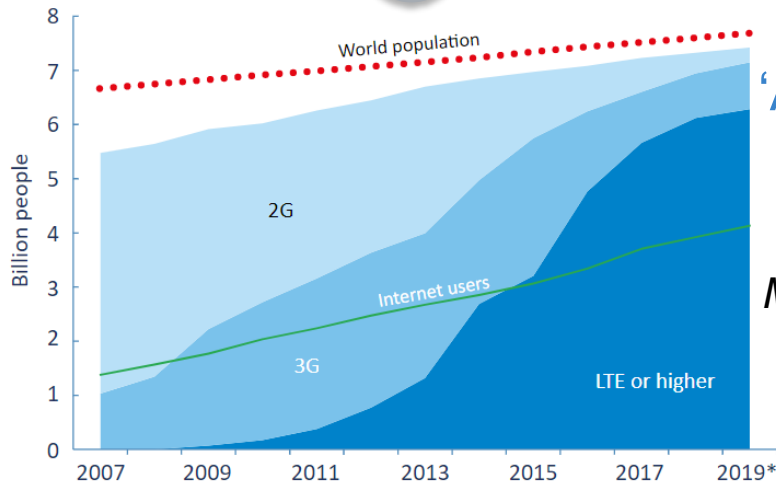
Public Communications

Military Health System Research Symposium

Provisional patent - Utility patent (ongoing)
Military Medicine, WHO Bulletin (planned publications)



Summary



‘Almost entire world population lives within reach of mobile network’

Measuring Digital Development: Facts and Figures, ITU, Nov. 2019



Proposed App with simple, user-centric features could:

Promote safe listening habits

Help in reducing NIHL risk

(App is not meant to diagnose or treat hearing impairment)

The Team



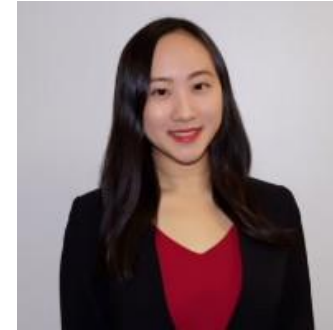
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Project Olympus Incubator



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Thank you

