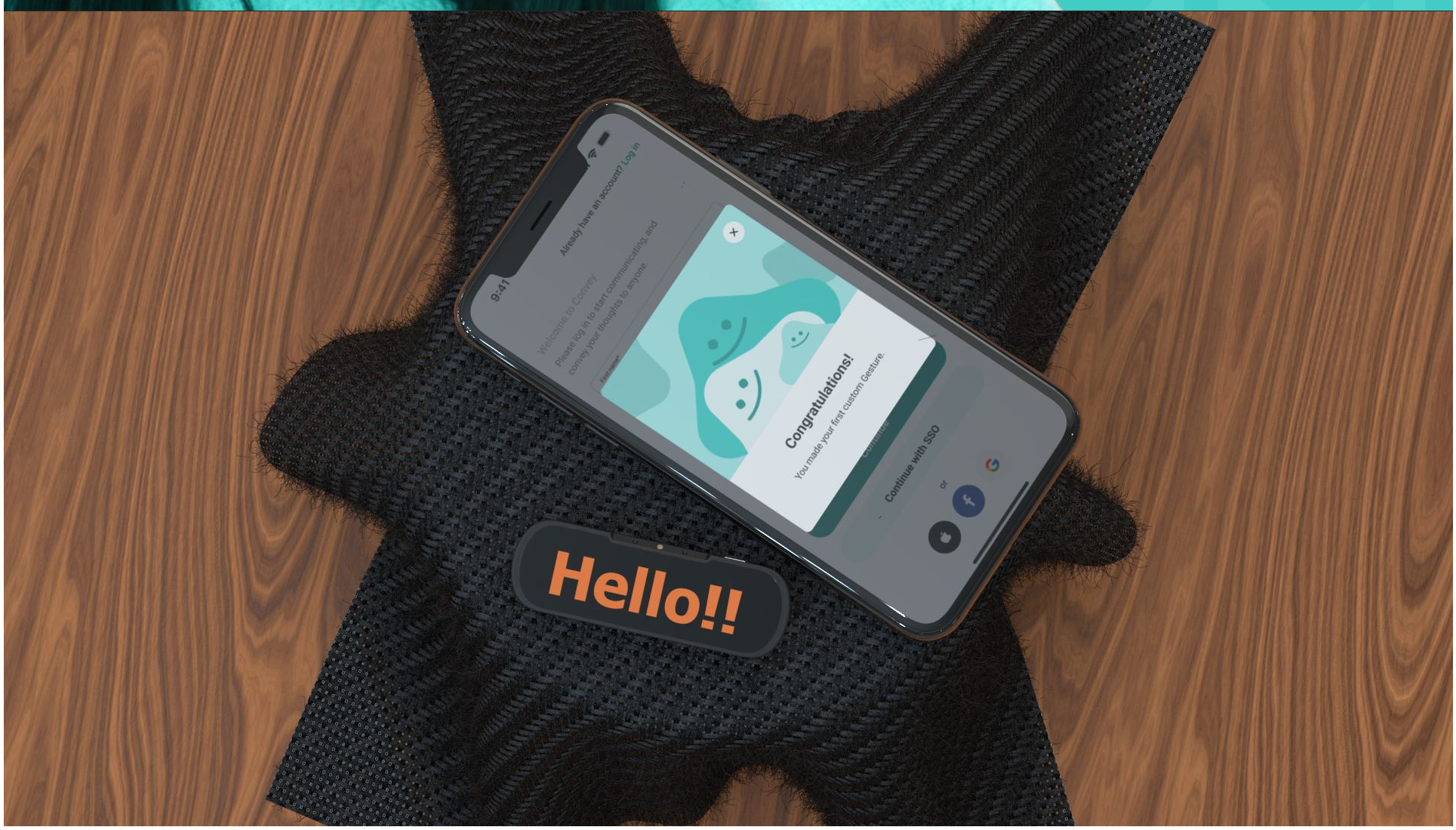
Enhancing Communication Possibilities

CAPSTONE

Convey

Project Roles

Design Research- Mihika Verma
Industrial Design- Sahitya Kashyap
Electronics Design- Sahil Bauri
Interaction Design- Veshwas Verma



THE PROCESS

TIMELINE

START

00. Indirect Research

Contextual Inquiry
Literature review
Competitive Analysis

Characterization
Literature review
Competitive Analysis

01. User Studies

Research Questions
Question 1
Question 2
Question 3
Question 4

Interviews
Users:
A mute Person
Technical Experts.

02. Requirements

Context Scenarios
Narratives, Objects, Functions, Systems.

System Requirement Definition
Functional Requirements.
Non Functional Requirements.

User Requirement Definition

03. Usability

Information Architecture
Card Sorting Method

Navigational Flow

Low Fidelity Prototypes
Wireframes
Sketches

04. Prototyping

Digital Prototypes-Interface
Simultations/Online Testing

Electronics
Test Bed
Wearable Pseudo-Model

Physical Prototype-Device
2D prototype sketches
3D Modelling, Simulations

05. Implementation

Programming-Software Design

Following KanBan Methodology

Device

Arduino Micro-Controller Architecture

NASA TLX based evaluation and cognitive load analysis

END

FINDINGS

SCENARIO & OPPORTUNITY

Blind and mute individuals encounter multifaceted challenges in communication, spanning difficulties in accessing information, navigating digital platforms, and expressing themselves verbally. Blind individuals face barriers in interpreting non-verbal cues during face-to-face interactions, limiting their social engagement and professional opportunities. Simultaneously, mute individuals confront social stigma and encounter limitations in educational and professional settings due to their constrained verbal expression. Despite these challenges, there exists a realm of promising opportunities for positive change. Advances in artificial intelligence and increased awareness of accessibility needs offer innovative solutions. Voice-activated AI assistants empower mute individuals, while technologies like AI-driven image recognition and natural language processing hold potential for enhancing the independence of the blind. To fully realize these positive changes, ongoing collaboration and a steadfast commitment to accessibility are paramount. By addressing these challenges and seizing opportunities for innovation, society can create a more inclusive environment, enabling both blind and mute individuals to thrive in various aspects of their lives.

1

By 2050 nearly 2.5 billion people are projected to have some degree of hearing loss and at least 700 million will require hearing rehabilitation

2

Globally, at least 2.2 billion people have a near or distance vision impairment. In at least 1 billion of these, vision impairment could have been prevented or is yet to be addressed.

3

The WHO stated that approximately 70 million people in the world are deaf-mutes. A total of 360 million of these individuals are children.

TARGET GROUPS

Blind Individuals

Healthcare Professionals

Care givers and Family Members

Blind and Mute Individuals

Government Agencies

Mute Individuals

Educational Institutions

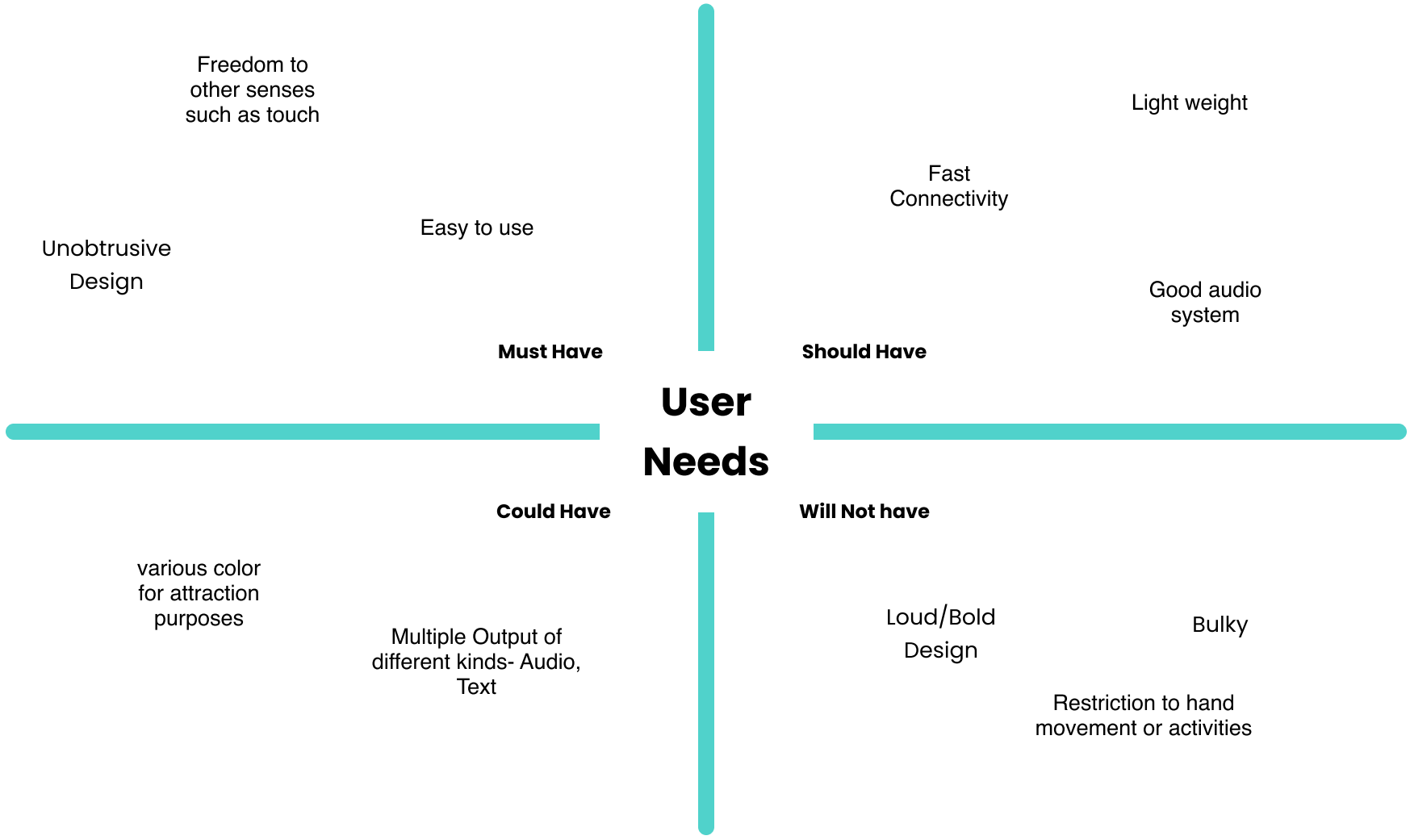
Accessibility Advocates

Organizations

Workplaces

Deaf Individuals

Deaf and Mute Individuals



Touch Sense Unobstructed

Seamless Intregation with App

Extremely easy to use & small learning curve

Ease in use

PERSONAS

Riya

"As someone blind, talking to mute or deaf people is challenging. Without words or signs, finding ways to connect becomes a unique task, like navigating through unfamiliar territory."

"Being mute, communicating with blind people is tough. Words help, but without visual cues, it's a challenge. It's like navigating in the dark, needing patience and creativity to connect our worlds."

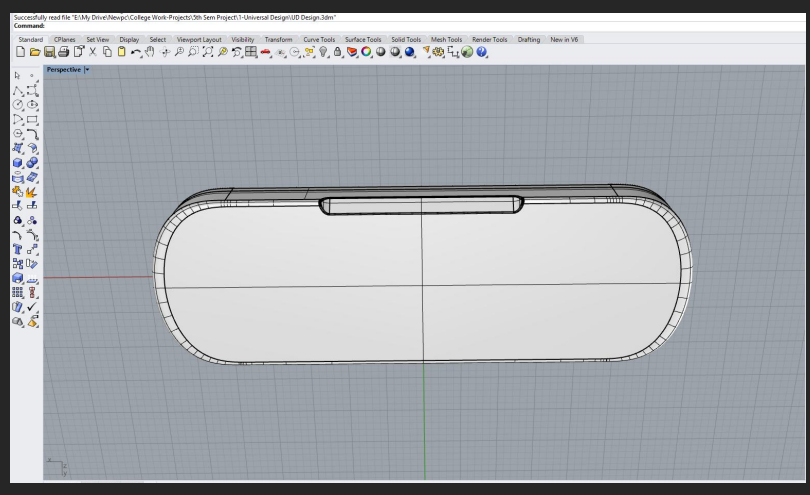
Sameeer

DEFINE

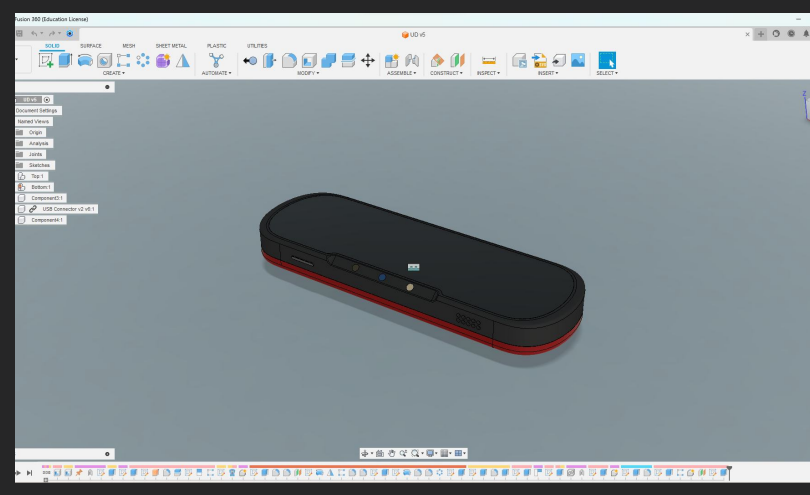
IDEATION PROCESS

Physical Product

Digital Application



Exterior Class A Surfacing

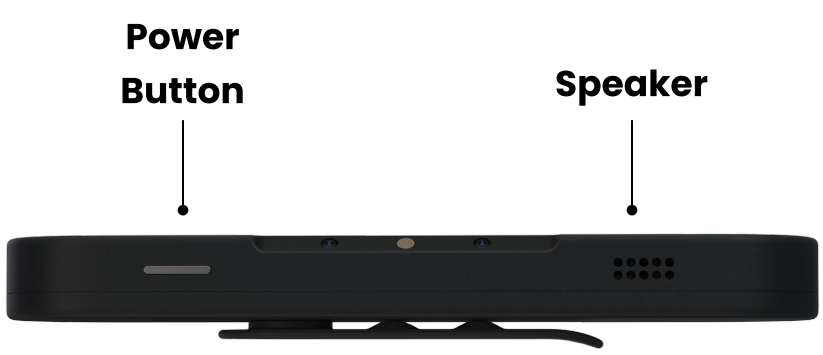


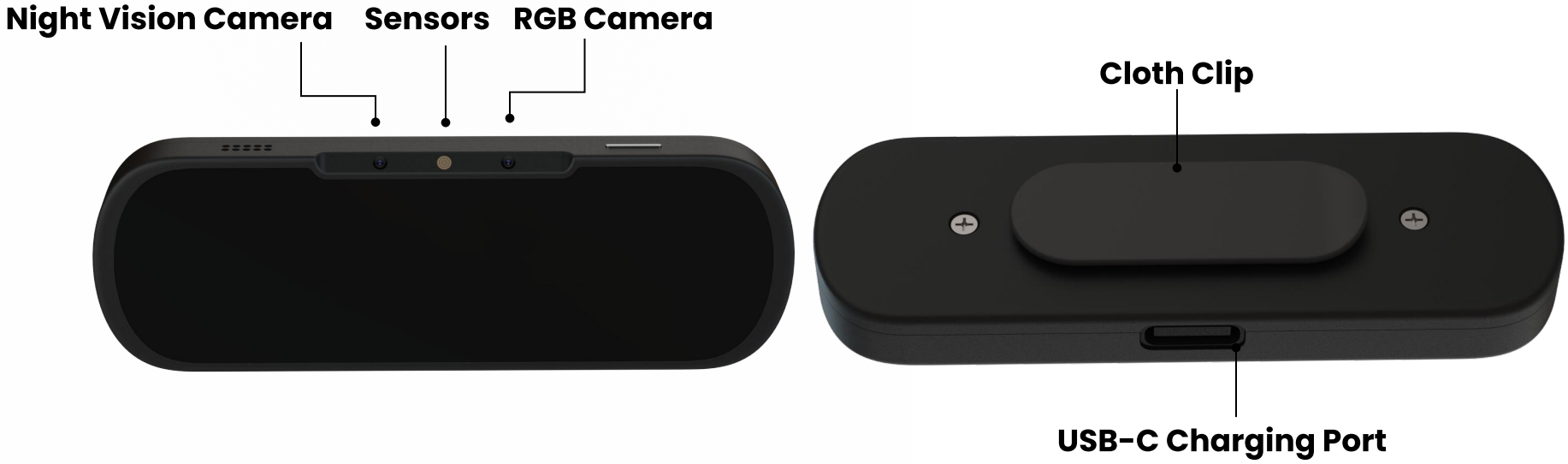
Parametric Technical CAD

OUTCOME

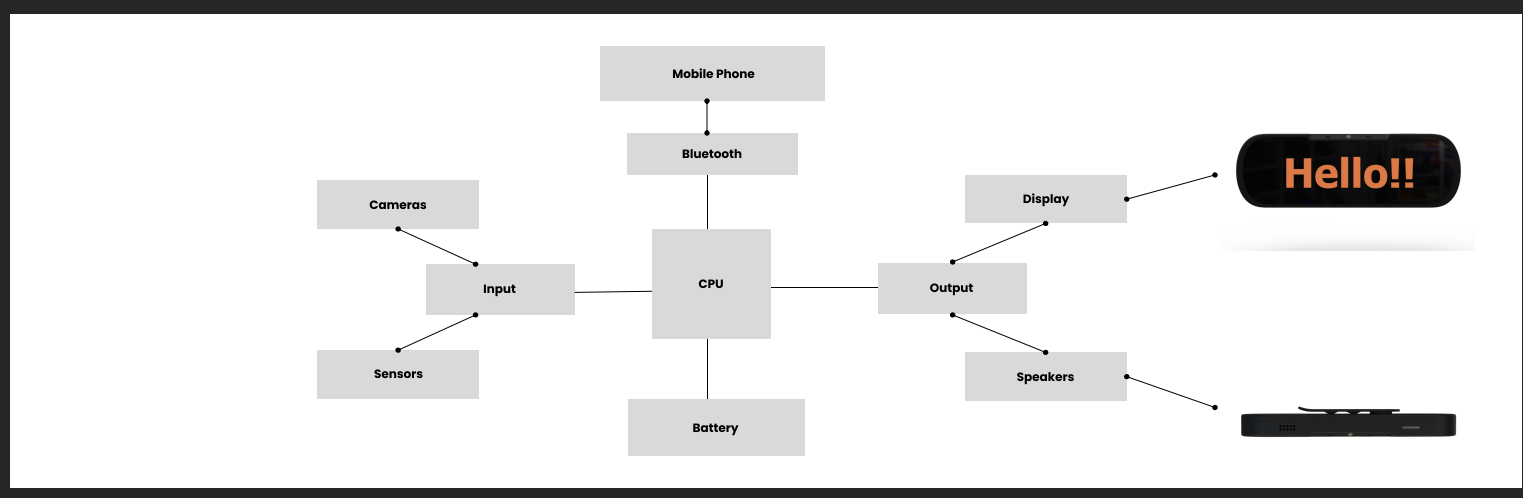
Universal Communication for ALL.

The device works on capturing hand gestures via cameras and analysis them through the sensors then this data is sent to the android chip (CPU) where through AI this data is converted and send to the mobile phone via bluetooth then as per the data saved in the application or the user has set the, the message then is sent back from the phone to the CPU where it sends the output on display as text and on speaker as audio





Internal working representation



Working

1.Input Sensors - Camera - Depth Sensor - Motion Sensor	**2.Input Processing Unit:** - These sensor inputs are sent to an Input Processing Unit that collects and manages the data from each sensor.	**3.Processor** - The processed sensor data is sent to the main Processor, where the core computations and data analysis take place.	**4.Data Conversion Module:** - Inside the Processor, there's a Data Conversion Module that converts raw sensor data according to the pre-saved data or algorithms.	**5.Output Processing Unit** - The converted data is then sent to an Output Processing Unit for further refinement and preparation for display.
6.Display Unit and Audio Unit - The final output is sent to the Display Unit and to the Audio Unit, which could be a screen and a speaker.	**7.User Interface** - The device might include a User Interface where users can interact with the system or adjust settings.	**8.Memory** - The Processor may have memory for storing pre-saved data, algorithms, and other necessary information.	**9.Power Supply** - A Power Supply unit is needed to provide power to all the components (Battery).	**10.Control Unit** - The Control Unit manages the overall functioning of the device, coordinating the flow of data between different components.

The device works on capturing hand gestures via cameras and analysis them through the sensors then this data is sent to the android chip (CPU) where through AI this data is converted and send to the mobile phone via bluetooth then as per the data saved in the application or the user has set the, the message then is sent back from the phone to the CPU where it sends the output on display as text and on speaker as audio

IDENTITY

TYPEFACES

DISPLAY

POPPINS

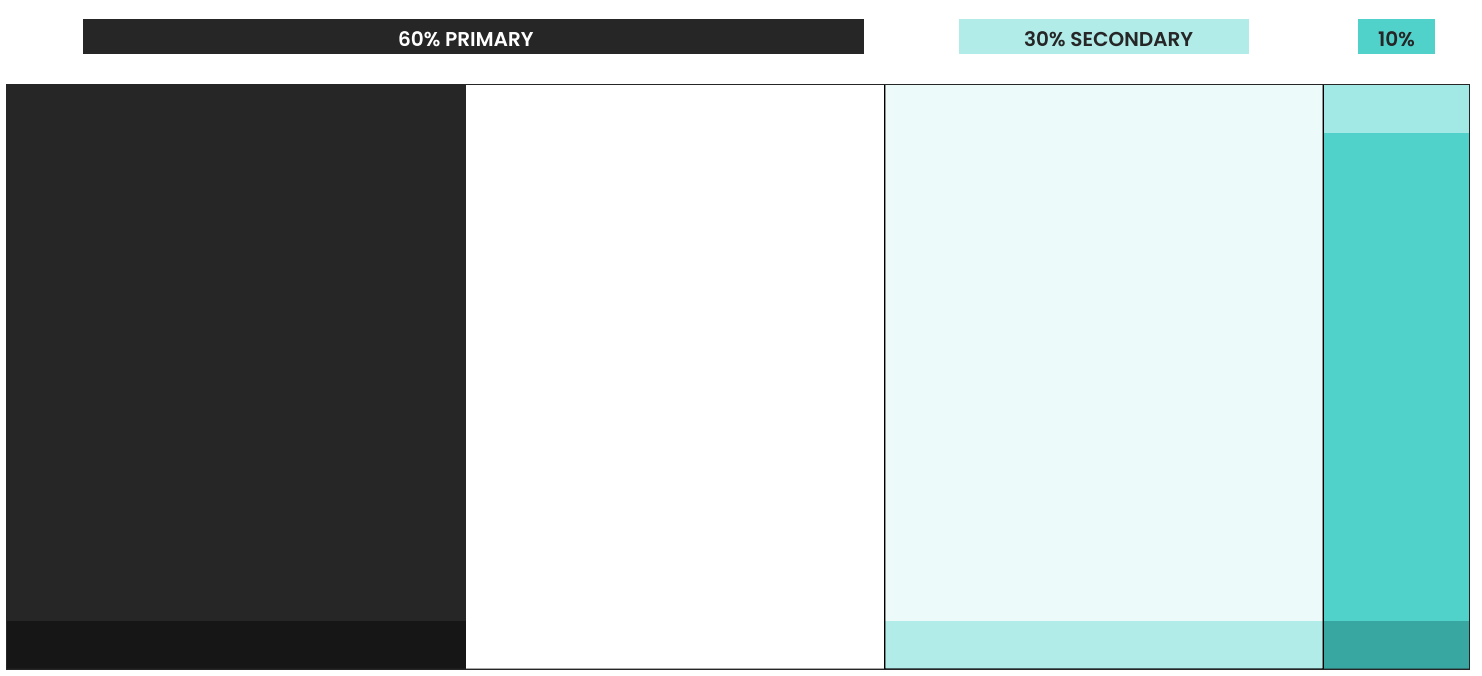
BODY

HELVETICA

Aa

85px 1.771rem	main	48px 1.000rem	Helvetica
64px 1.333rem	main	36px 0.750rem	Helvetica
		27px 0.562rem	Helvetica
48px 1.000rem	main	20px 0.417rem	Helvetica
36px 0.750rem	main	15px 0.312rem	Helvetica

COLOR PALETTE



INTERFACE

Designing Interface aimed at facilitating communication between mute individuals and those unfamiliar with sign language requires careful consideration of accessibility, user intuitiveness, and customization. To ensure an inclusive experience, the UI prioritizes clarity and simplicity. Icons and labels are designed with universal recognition in mind, aiding users in selecting their preferred sign language and output language effortlessly. The interface prominently features options for users to personalize the system, allowing them to add custom gestures that hold personal meaning.

Simplicity and Ease

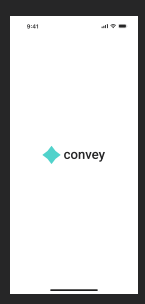
The UI's clear icons and labels make navigation effortless, catering to users of all tech backgrounds.

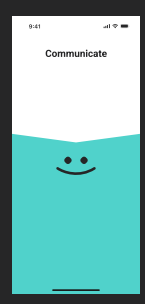
Tailored Communication

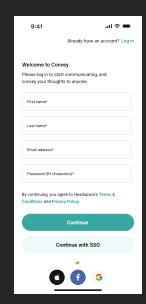
Users can personalize their experience by choosing languages and adding custom gestures, ensuring adaptability to diverse communication styles.

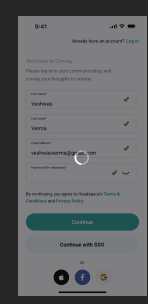
Delightful Visuals

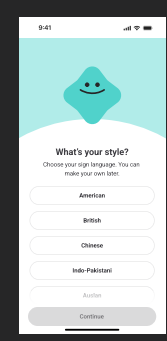
Visual cues assure users that their selections are registered, instilling confidence in the communication process.

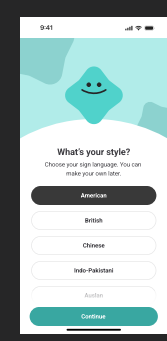


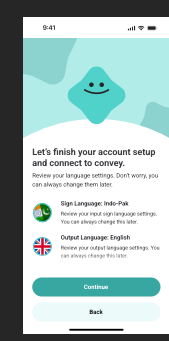


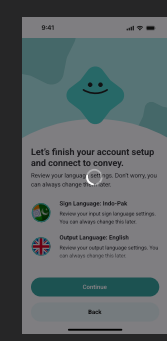


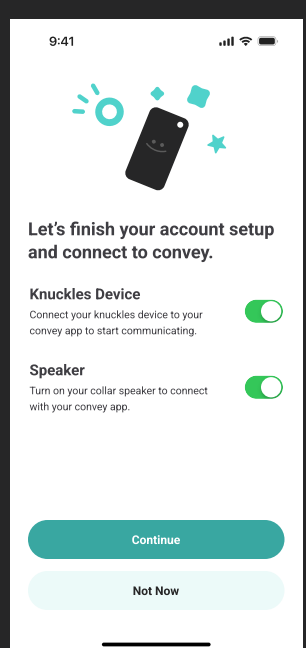


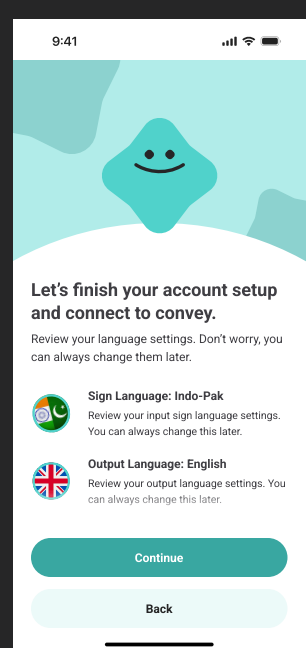


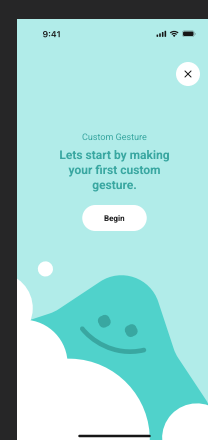


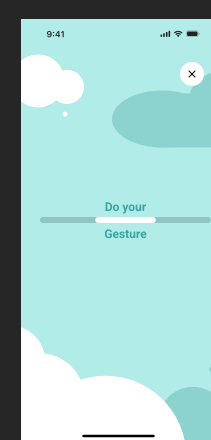


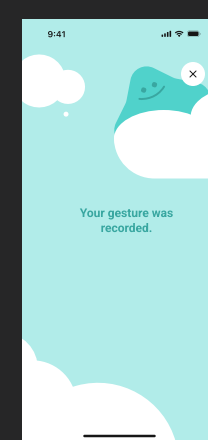


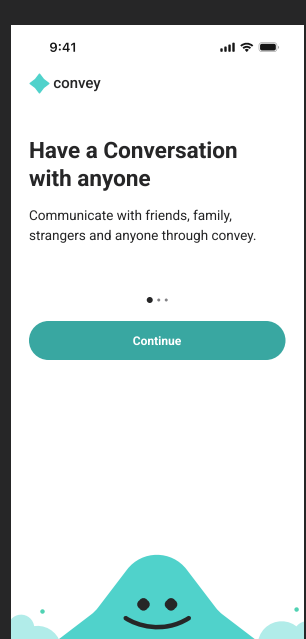


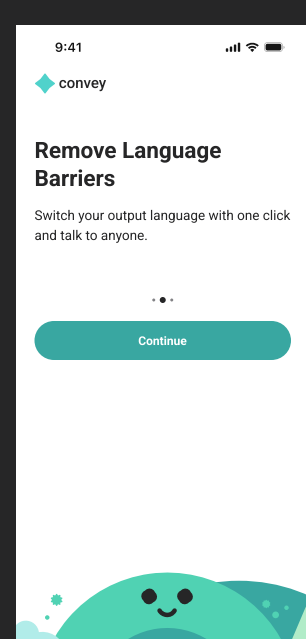


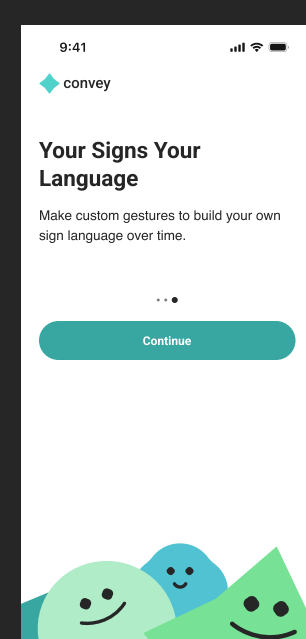












THANK YOU !