

Mobile Phone Navigator for fully and partially visually impaired

Team-6

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Problem Statement

Mobile Phone Navigator application for partially and fully visually impaired

- Improving the mobile phone using experience for people with visual impairment.

OBJECTIVES

- To develop a fully functional mobile application to help the partially and fully blind in navigating through the mobile phone.
- To provide a user-friendly and supportive UI for the partially and fully blind people by following the HCI principles(Ben Shneiderman's Eight Golden Rules).
- To provide features such as :
 - ❖ Currency recognition
 - ❖ Time, Date and battery status
 - ❖ Voice based calling
 - ❖ Voice enabled messaging

Guidelines followed

Apart from covering general issue i.e, weakening of eyesight for both moderate and extreme

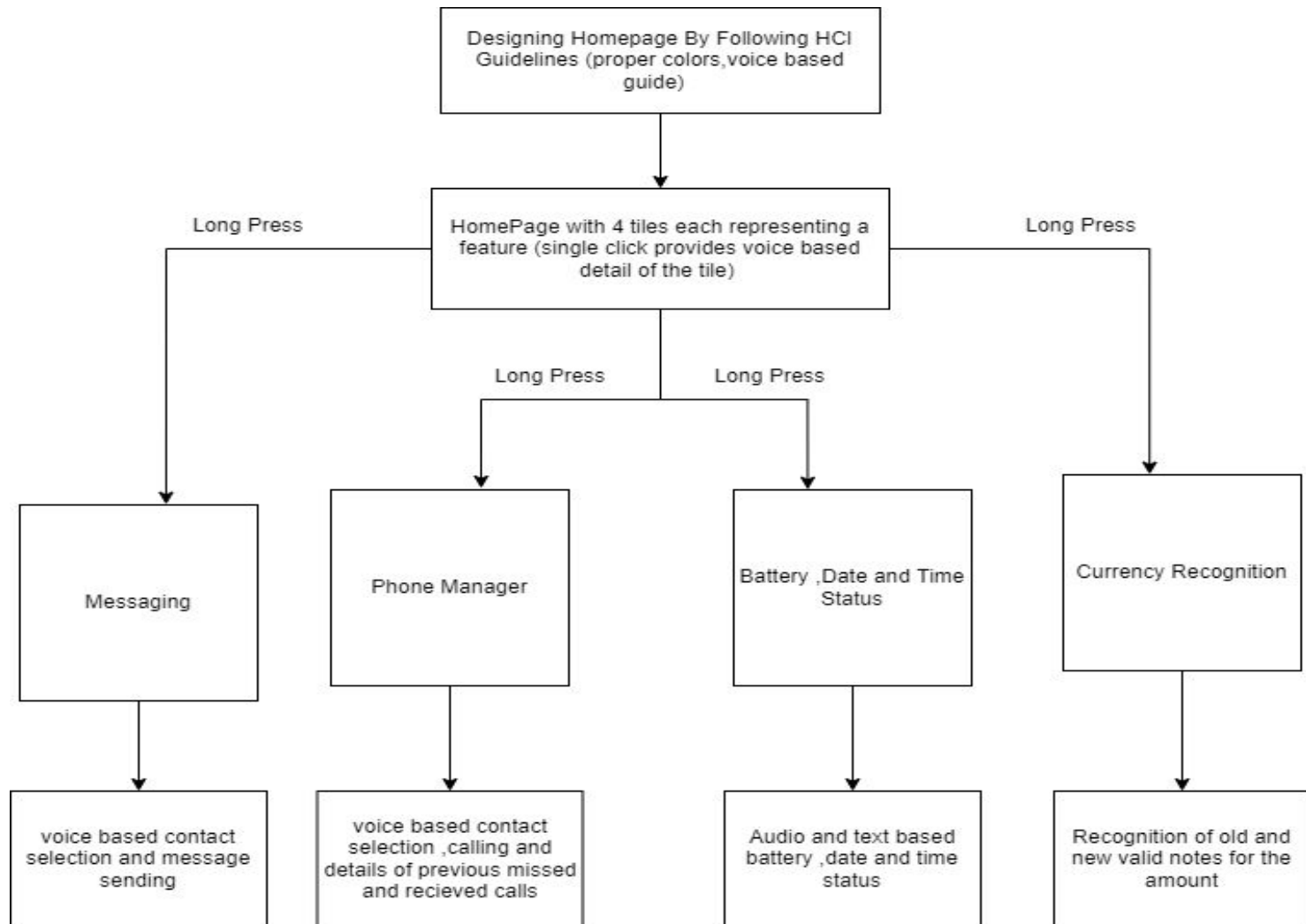
Loss, some other visual disorders were considered while designing the application

- 1) Red and Green : People suffering from **Dichromacy** (person who can distinguish two colors) can not distinguish between red and green.
- 2) Extreme Dark Colors : People suffering from **Protanopia** (colour blindness resulting from insensitivity to red light, causing confusion of greens, reds, and yellows) can not distinguish dark colors (12.5%)
- 3) Light colors and greys : People suffering from **Tritanopes** (inability to distinguish between blue and yellow) cannot distinguish light colors and greys. (13%)
- 4) Green Colors : People suffering from **Deuteranomalous** exhibits partial loss of green color vision.(62.5%)

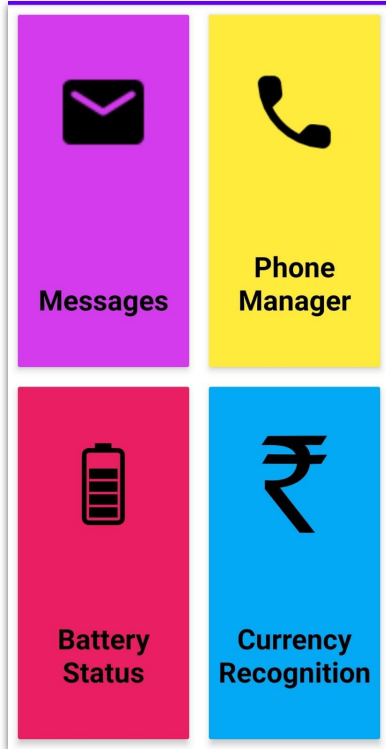
Guidelines followed

- Padding of 0.6% has been provided such that the borders do not collide.
- Text size has been sufficiently large to support easy reading.
- Contrasting colors have been used to support the color blind people in navigation through the app.
- Elevation has been provided to distinguish the icon from its background.
- Audio support has been provided to aid the fully blind in navigation.

WorkFlow:



Results



HomePage

A verbal greeting and general instructions are given to the user once he opens the application. Single tap on any of the 4 given tiles gives the details of these functionalities and on long press on any tile, the corresponding functionality activity is opened. Along with following most of the HCI guidelines, different research backed UI design for visually impaired.

Thu,07 April 2022 15:33:24



56.0

Phone is not charging

Date Time and Battery Status Info

This page shows the user and also verbally tells the user about information like present date and time and also about basic details of phone(battery % and charging status).

Calling

User taps anywhere on the screen to enter phone number and then taps again to make the call.

Call Manager

Google



8449 33701

English (India)

Currency Recognition



Prediction is 200 Rupees

Currency Recognition

Though it's not meant to be a part of phone navigator, this feature is provided because it is a common hardship faced by most of the visually impaired people.

Messaging

Voice based contact entering and then taping screen again to speak the message. Tap again to send.

Phone Number

8449 337 901

Google

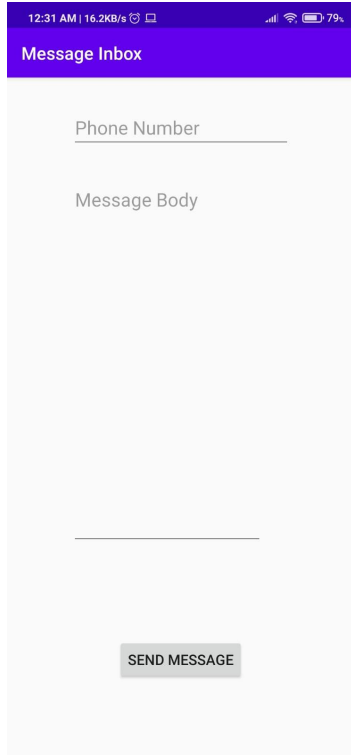


human computer interaction

English (India)

Google speech services
converts audio to text and
shares the text with this app.

Changes after user feedback



12:31 AM | 16.2KB/s | 79%

Message Inbox

Phone Number

Message Body

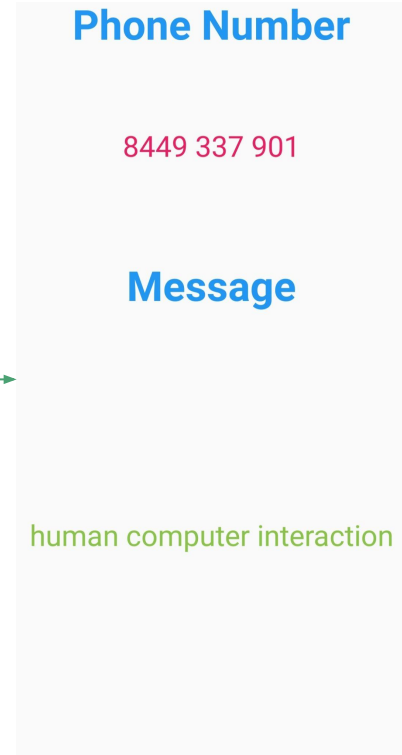
SEND MESSAGE

This screenshot shows a mobile app interface for sending a message. It features a purple header with the status bar at the top, a white title bar, and a light gray background. There are two input fields: 'Phone Number' and 'Message Body'. A 'SEND MESSAGE' button is located at the bottom.

Version 1

Improvement after user feedback

Instead of filling fields and tapping buttons,
Complete screen is made tappable to proceed
to next step



Phone Number

8449 337 901

Message

human computer interaction

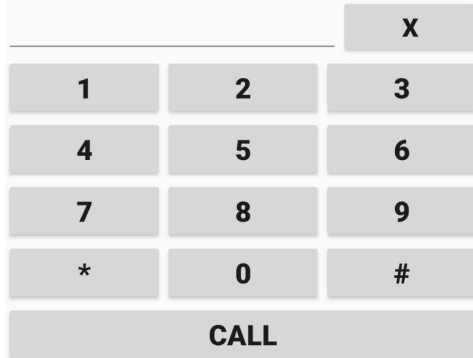
This screenshot shows a simplified mobile app interface. It has a light gray background. The 'Phone Number' label is at the top, followed by the number '8449 337 901'. Below that is the 'Message' label. At the bottom, the text 'human computer interaction' is displayed. The interface is designed to be a single-tap action to proceed to the next step.

Version 2



Initially a talkback keyboard was used,

But to make it more user friendly,
fully voice based commands were added and
small buttons were removed.



Call Manager

Google



8449 33701

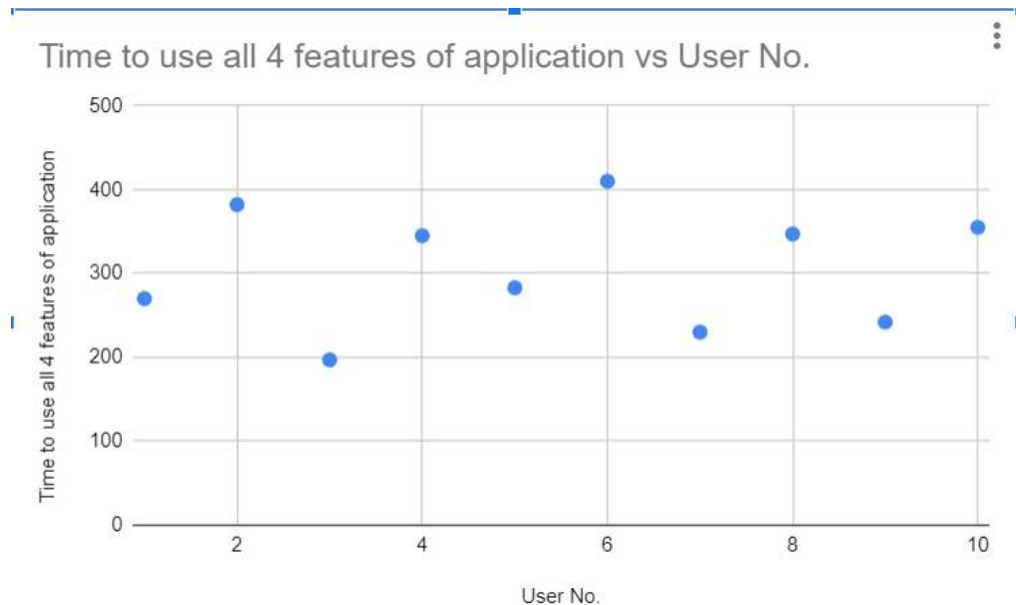
English (India)

Analysis

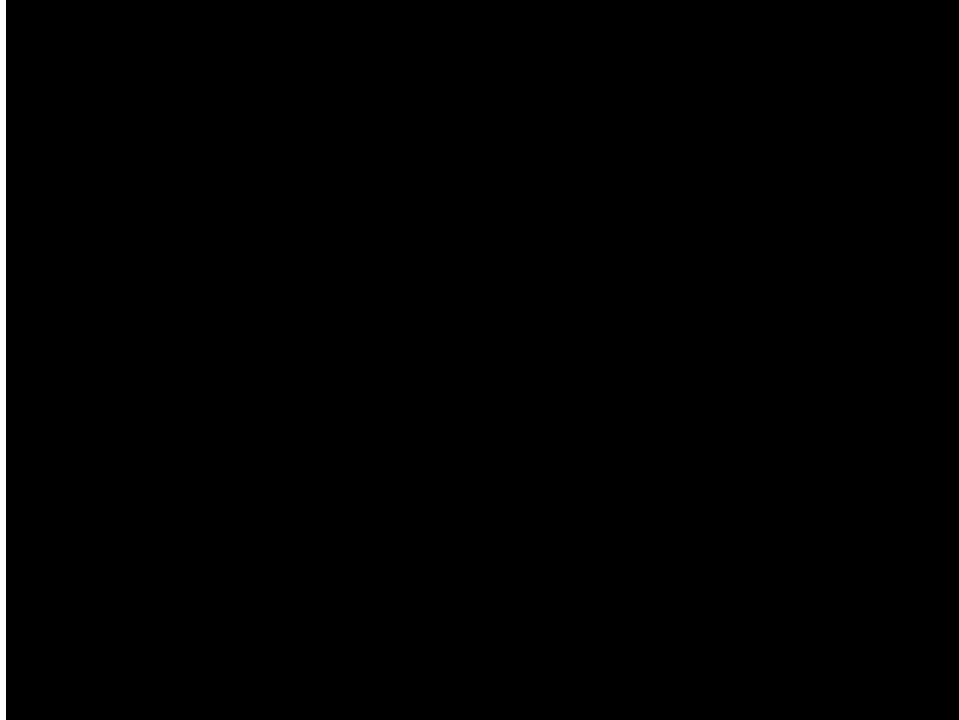
Questions	1 Very poor	2 Poor	3 Fair	4 Good	5 Excellent
1)How easy was to navigate through the app?					
2)How easy was to recover from the mistakes committed by you?					
3)How intuitive was app ?					
4)How good was the feedback on your successful completion of action?					
5) How correct were results?					

User No.	Question 1	Question 2	Question 3	Question 4	Question 5
1	4	4	4	5	3
2	4	4	4	5	4
3	5	4	4	4	4
4	5	5	4	4	5
5	3	4	3	5	4
6	4	3	3	5	5
7	5	4	5	4	4
8	5	4	5	4	4
9	4	3	4	4	3
10	3	5	4	4	5

User No.	Time to use all 4 features of application
1	4 min 30 seconds
2	6 min 22 seconds
3	3 min 17 seconds
4	5 min 45 seconds
5	4 min 43 seconds
6	6 min 50 seconds
7	3 min 50 seconds
8	5 min 47 seconds
9	4 min 02 seconds
10	5 min 55 seconds



Demo Video



Thanks