Human Computer Interaction

Motion Detection recognition for visually impaired people

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Need Finding

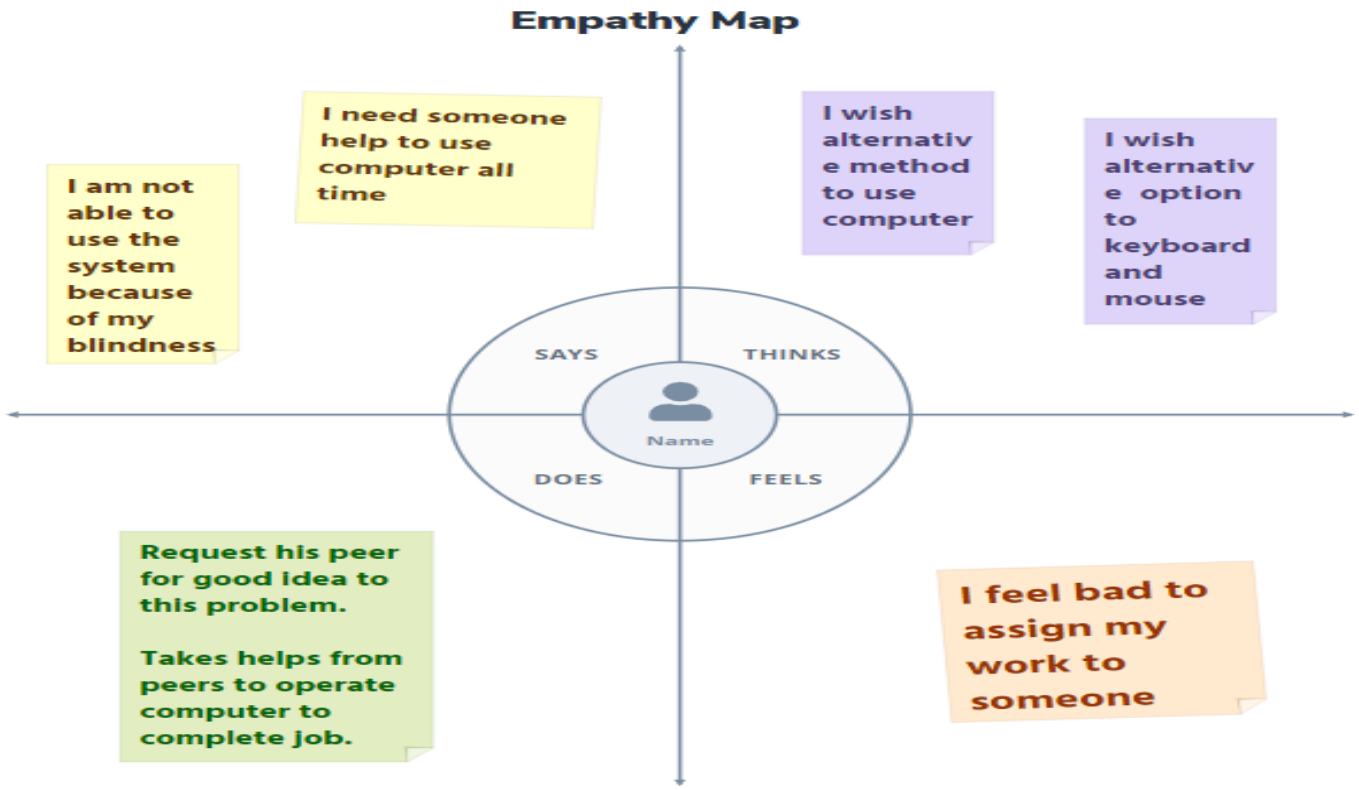
PROBLEM DOMAIN : HANDS GESTURE BASED MOUSE CURSOR CONTROL AND TYPING

* Visually impaired find it difficult to do access or work with computers.
* They are completely depends on someone who can operate system.
* Here the audience addressed involve,
  - Blind people
  - Person knows only local language
* The intended application would help the visually impaired person with the help of voice instruction and the recognition of the hand gesture.

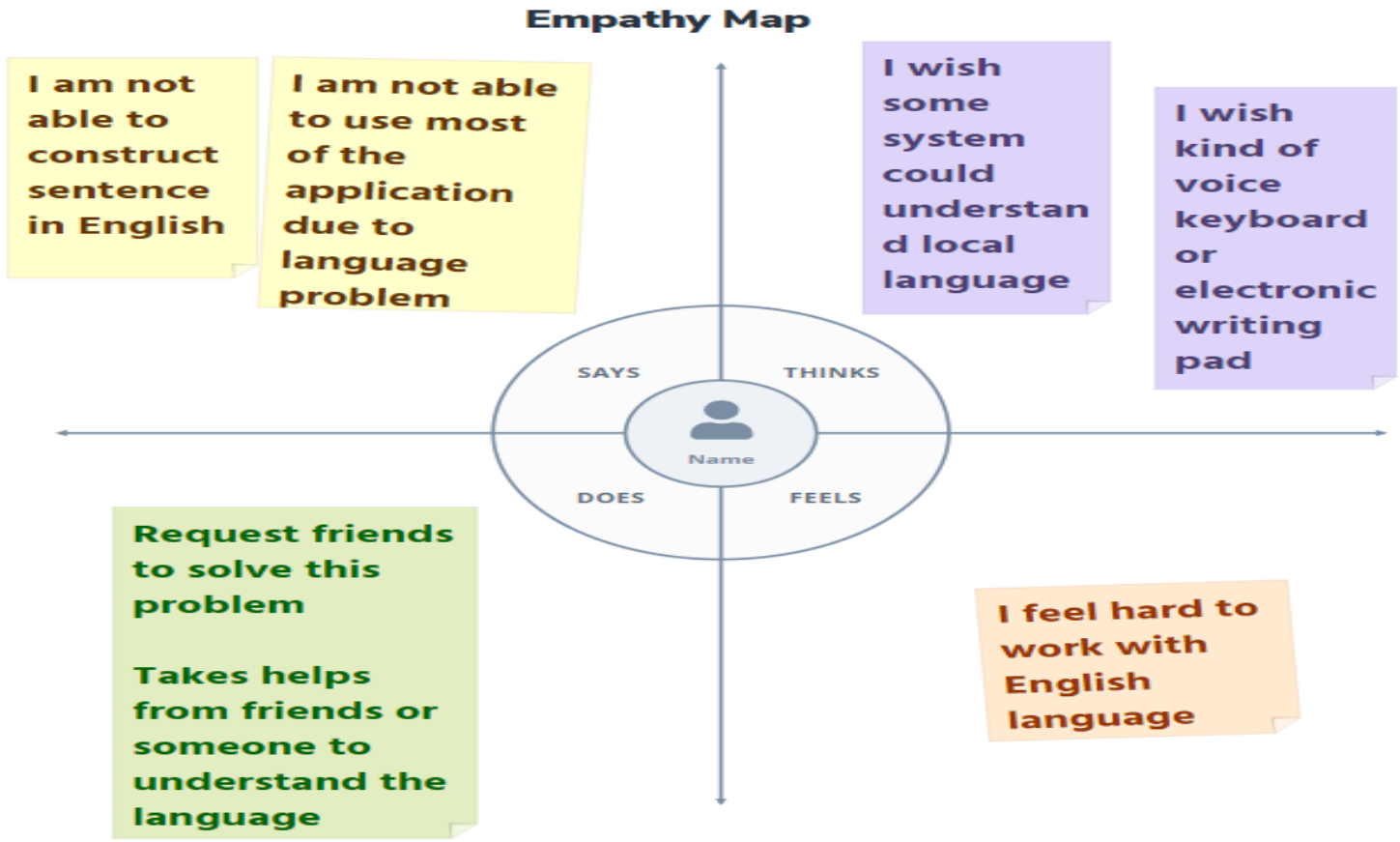
Methodology

1. ***DECIDE ON THE INTERVIEWEE(S)***
2. ***DESIGN THE QUESTIONS TO BE ASKED TO THE INTERVIEWEE(S)***
3. ***CONDUCT THE INTERVIEW PROCESS***
4. ***ANALYZE AND FORMULATE THE INSIGHTS GAINED FROM THE INTERVIEWS***

Interview with blind person

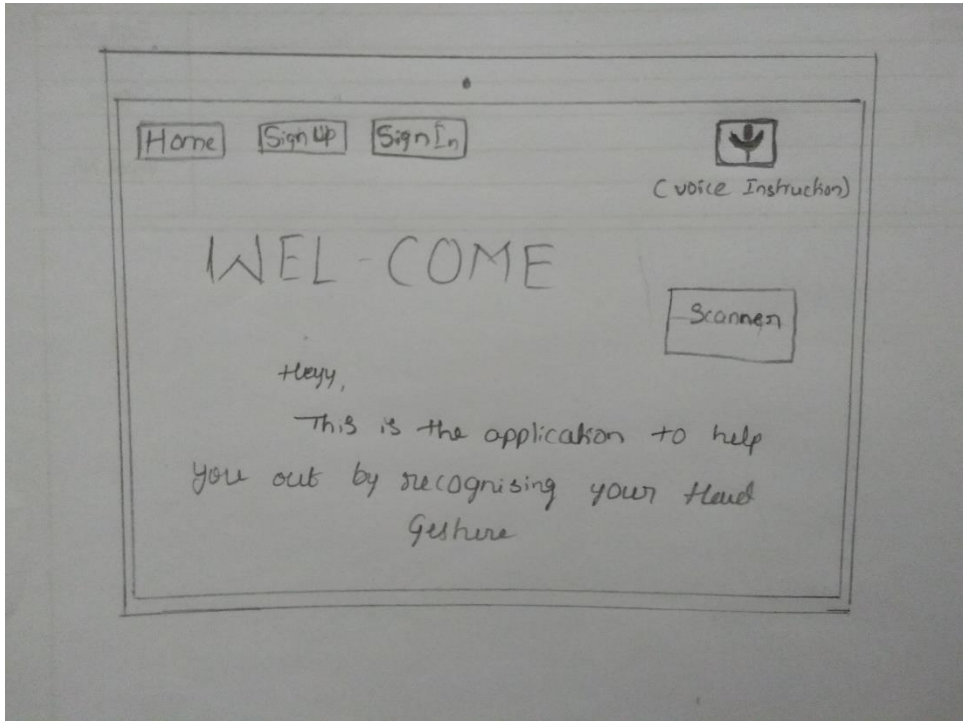


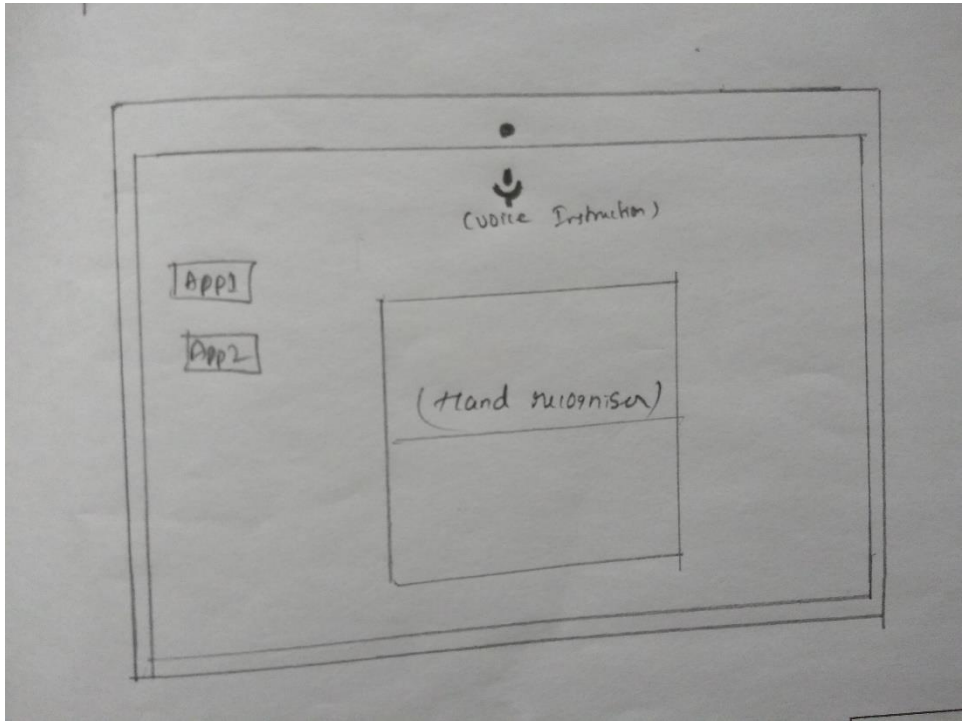
Ordinary person with language problem



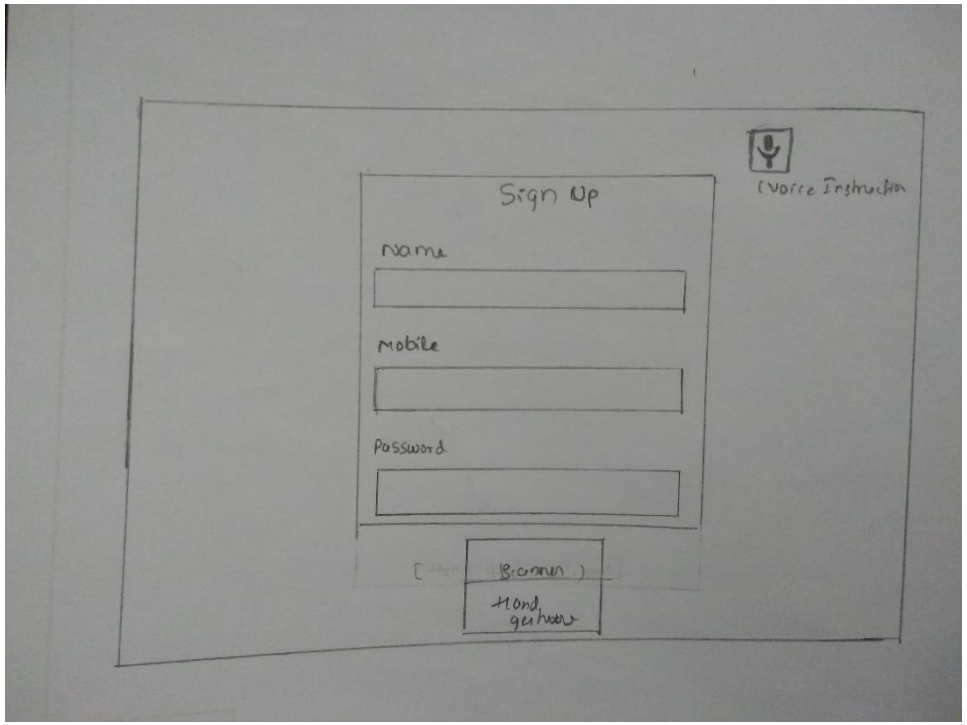
Low Fidelity Prototype

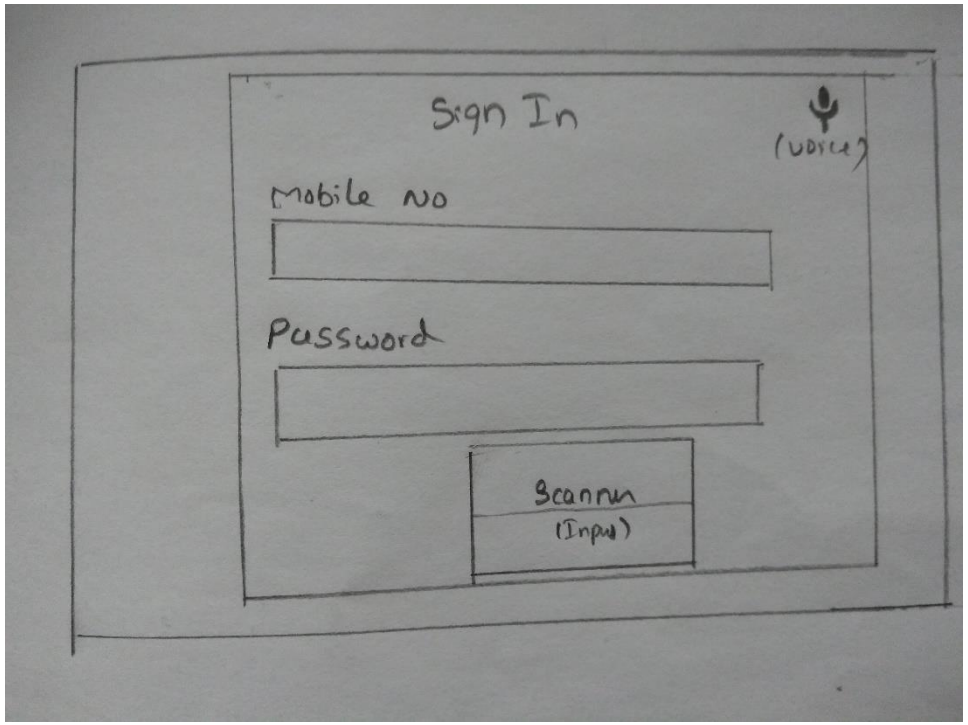
Lock screen and Desktop





Sign Up and Sign In





Heuristic Evaluation

Visibility of system status

- *The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.*

- The user can be informed about the system status through visual and auditory elements. The hand recognizer will recognize the gestures and display on the screen, and the system will give audio output also as to what action is being performed on detection of the gesture.

Match between system and the real world

- *The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.*

- To make the interaction between the user and system as seamless as possible, we make use of more images, and less text form, and also keep the images, forms and texts to be familiar to the user, and easy to understand.

User control and freedom

- *Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.*

- We have features that can help to undo the operations if some gestures are incorrectly detected, or if motion is inappropriately considered. The user also has the freedom to cancel the current ongoing operation.

Consistency and standards

- *Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions*

- We have followed a consistent design pattern throughout the UI. A good percentage of uniformity is maintained, that is pleasing to the eyes. The audio services complement the UI well, and the overall working of the system is consistent in this regard, following standards of design that we have laid down.

Error prevention

- *We must seek to prevent errors rather than having an error prone software. Thus to prevent errors different operations are expected to take place.*

- We have implemented password protection features, and have measures in place for incorrect entry of user-id / password. The audio services also help in guiding the user through, and preventing errors. The simple and minimalistic UI helps keeping the errors to a very low rate.

Recognition rather than recall

- *Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.*

- The gestures and motions that are detected by the system, will be logged successfully, and the triggers for the actions will be followed. The previous gestures need not be remembered in this aspect, as the previous states will be stored in the system, and recall isn't required in this case.

Flexibility and efficiency of use

- *Accelerators -- unseen by the novice user -- may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.*

- The system can be used by both experienced and novice users, as the UI is very simple, and the sensors work very easy, are easy to install and use on hands. Each gesture will be displayed on screen and an audio message will help make it more clear and efficient.

Aesthetic and minimalist design

- *Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of Information and diminishes their relative visibility.*

- Each page of our UI is kept simple, and designed in a vanilla fashion. There is nothing complicated in the UI, which makes it easy for the users to use the product. Although we have kept the UI simple, it is aesthetic in its own ways, with good placements of every icon, and clear and large images of the gesture and motion detected. The UI isn't crowded with unnecessary items.

Help users recognize, diagnose, and recover from errors

- *The website displays Error messages expressed in plain language .It precisely indicates the problem, and constructively suggests a solution.*

- Although we have tried to minimize chances of errors occurring, the system of error messages and alerts are in place to help the users recognize and recover from errors. The audio and visual fronts compromise each other and work in a very efficient way to handle errors.

Help and documentation

- *The website is self explanatory and easy to use. The users can however access the help page to use the website effectively.*

- The help section would include an FAQ section as well, where the major questions have solutions with them, that can also be read out in audio form. Other than this, the option to get in touch with customer care is also provided.

Applications

- Hand Gesture detection with talkback feature can further be used in automotive.
- Virtual Controllers like in game stations.
- In Machine Wheel Chairs.

Thank You