TACTILE TEXT

Bridging the Digital Divide: Accessibility App for the Visually Impaired

A Presentation by Vishwa Kumaresh

The Problem

As Helen Keller once said, **"The only thing worse than being blind is having sight but no vision."** Unfortunately, this sentiment rings true for many of the visually impaired individuals around the world.

According to the World Health Organization, there are an **estimated 285 million visually impaired** individuals globally, and a significant portion of them struggle to find employment due to the lack of accessible digital tools and resources.

Recent studies reveal that **only 10%** of the visually impaired population is Braille literate, yet an astounding **90% of the literate are employed**! This demonstrates a **pressing need to develop a solution for the visually impaired to access the internet.**

Inspiration!

INTERVIEWS

- I have interviewed several visually impaired professors, who themselves teach visually impaired students.
- This gave me an understanding on the actual problems faced by them
- Inclusive design principles create a better experience for everyone. Regular users appreciate the convenience of voice commands and gesture recognition.
- This also helps people with other disabilities. Features like keyboard navigation and haptic feedback prove invaluable for people with dexterity limitations or conditions like ALS

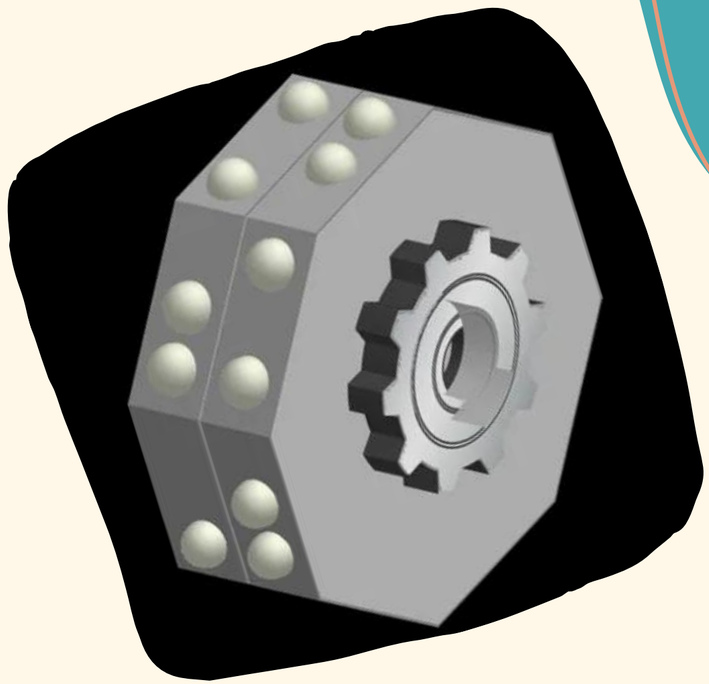
The Solution

At the heart of this solution lies a **tactile braille board,** combining cutting-edge hardware with advanced software features to revolutionize internet accessibility. The board dynamically refreshes to reflect the text on the screen. We've incorporated a suite of **software features powered by advanced AI**, including:

- **Natural Voice Assistance:** That helps guide the users on the page
- **Visual Image Captioning:** Unveiling the world of imagery through comprehensive audio descriptions.
- **Contextual Hyperlink Detection**: Explains the link you will explore
- **Voice Navigation:** Travel with confidence using voice-guided maps
- **Gesture Recognition:** Interact with the digital world through intuitive gestures

Let us explore these features some more!

The Hardware



- Enables users to physically read digital text
- Paired with **OCR App** to read text from images
- Consists of two rotating wheels to permute different characters.
- Has buttons for text input
- Built to be durable, portable, and user-friendly, it allows users to access information with ease, whether it's reading books or taking notes.

My Prototype

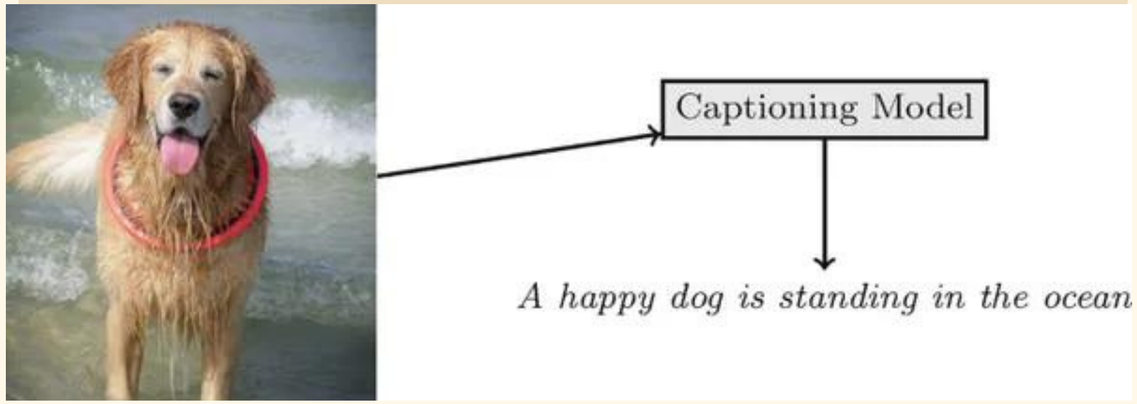
Features 1 and 2

NATURAL VOICE ASSISTANCE

- Understands complex instructions and context-specific requests.
- Provides clear and concise voice guidance within apps.
- Learns user preferences for personalization.

VISUAL IMAGE CAPTIONING

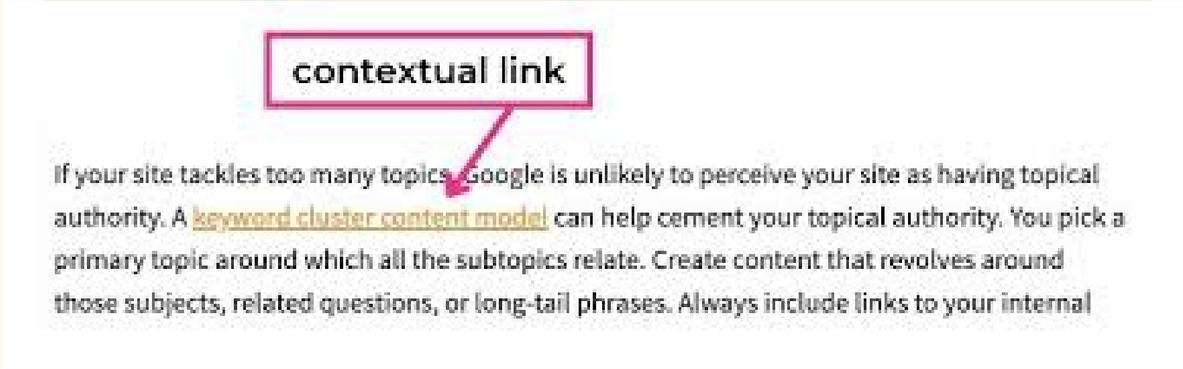
- Contextual Captioning
- Multi-Lingual Support can be added



Features 3 and 4

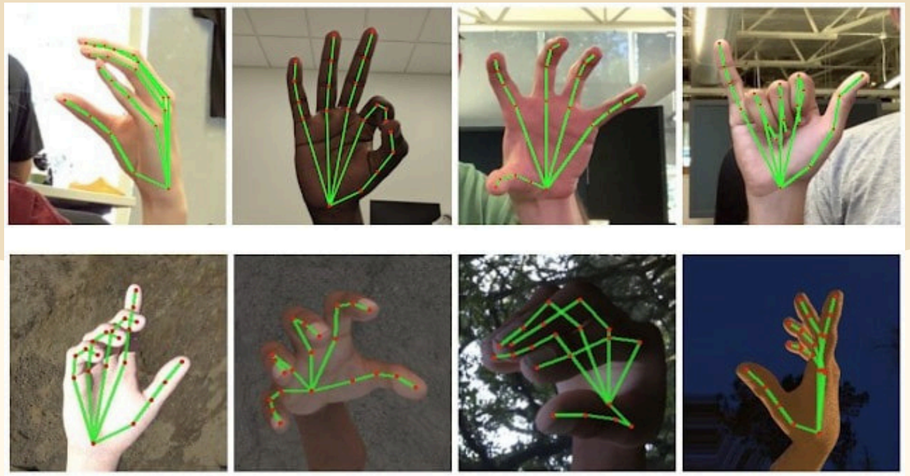
CONTEXTUAL HYPERLINKS

- Contextual Information for Better Understanding
- Customizable settings for user preference



GESTURE RECOGNITION

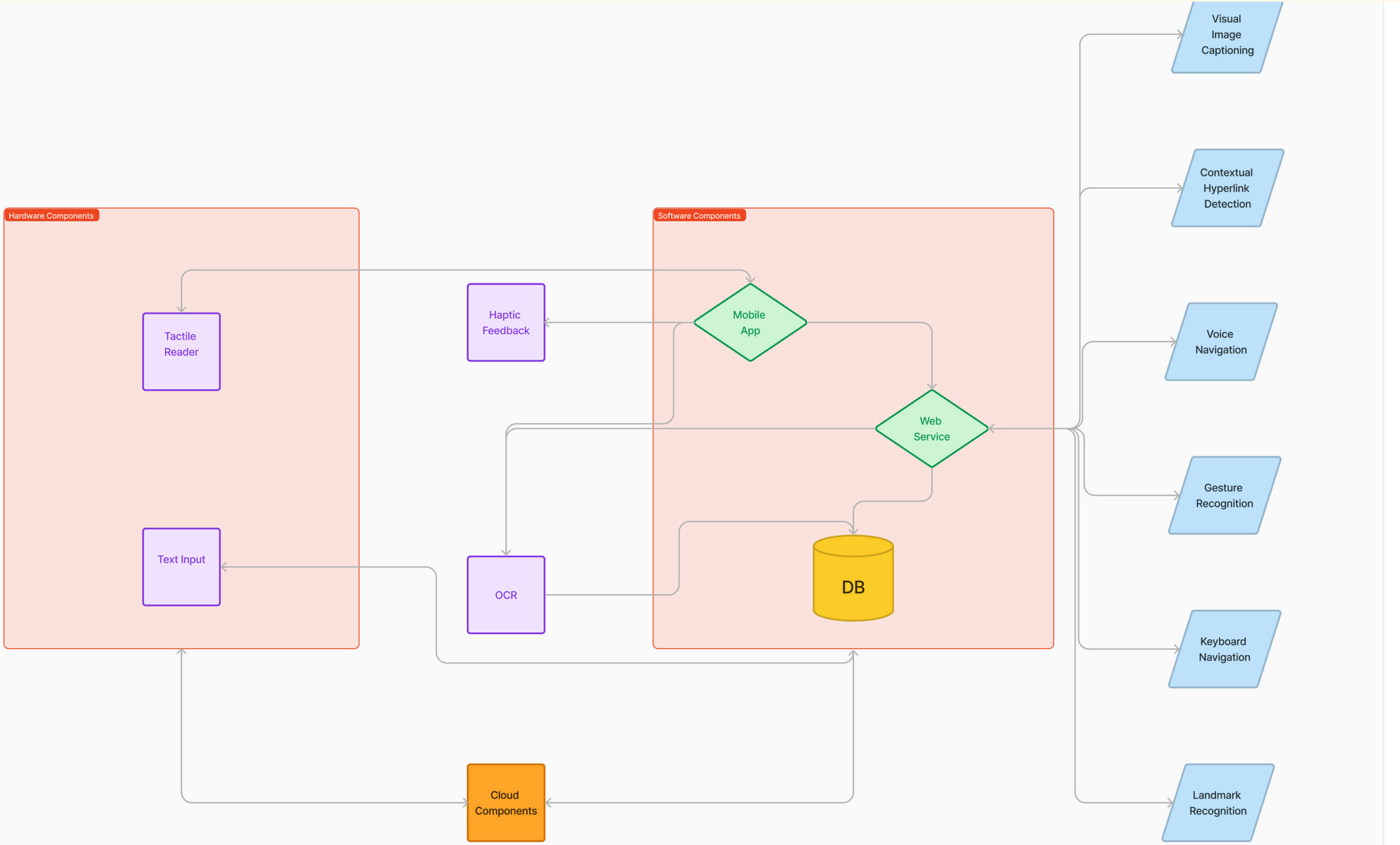
- Customizable Gestures
- Integration with other accessibility features



Integration with other Apps

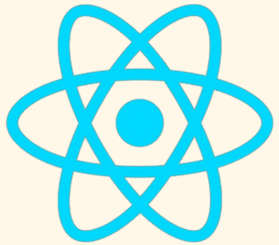
- Uses Screen Reader feature to automatically read and process everything on the screen
- This helps to integrate with other consumer apps to enable features across all of them
- Can integrate **haptic feedback** as well

Process Flow Diagram



Techstack and Tools

AI TOOLS



Unique Selling Points

HARDWARE AND SOFTWARE INTEGRATION

INCREASED INDEPENDENCE AND ACCESS TO INFORMATION

MULTIMODAL INTERACTIONS

AI-FEATURES FOR SEAMLESS EXPERIENCE

Impact and Competitive Advantage

SOCIAL IMPACT

Enhances Quality of life by providing greater independence. It also promoted inclusivity and accessibility.

BUSINESS IMPACT

Addresses the gap in the market for inclusive apps that cater to diverse needs, not just for visually impaired but also for individuals who value user-friendly design.

Business Model

SUBSCRIPTION MODEL

API-PURCHASES

TARGETED ADVERTISING

DATA ANALYTICS AND INSIGHTS

THANK YOU!

This project goes beyond accessibility; it represents ingenuity and a future where technology empowers everyone. We are creating a first-of-its-kind solution that leverages a unique mix of hardware and software to bridge the digital divide for the visually impaired.

About me

My name is **Vishwa Kumaresh,** a third year undergrad at SNU Chennai. I'm a strong believer in inclusive access for all, and I'm working towards incorporating AI technologies to assist in everyday use.