INDOOR NAVIGATION AND MAPPING SYSTEM DEVELOPMENT FOR THE VISION IMPAIRED

Yeong Yi Cheng

Outline

01 **Problem Statement**

02 **Project Objectives**

03 **Significant Contribution**

04 **System Overview**

05 **Objective Evaluation**

06 **Demo**

Problem Statement

01 285M visually impaired worldwide, predominantly in low-income settings

02 Impairments reduce independence, increase caregiver reliance

03 Indoor navigation for visually impaired individuals

Project Objectives

MAIN GOAL:
Develop an indoor navigation and mapping system to assist individuals with vision impairment.

To Create a Cross-Platform Application

- Ensure compatibility with both Android and iOS.
- Broaden user demographic.

To Develop an Indoor Mapping Component

- Provide map customization and information features.
- Offer sound and vibration assistance

To Ensure Accessibility Function Compatibility

- Integrate with TalkBack (Android) and VoiceOver (iOS).
- Reduce the time needed for users to become familiar with the application's features.

Contribution

01 Advancing assistive technology for visually impaired individuals

02 Real-world effectiveness

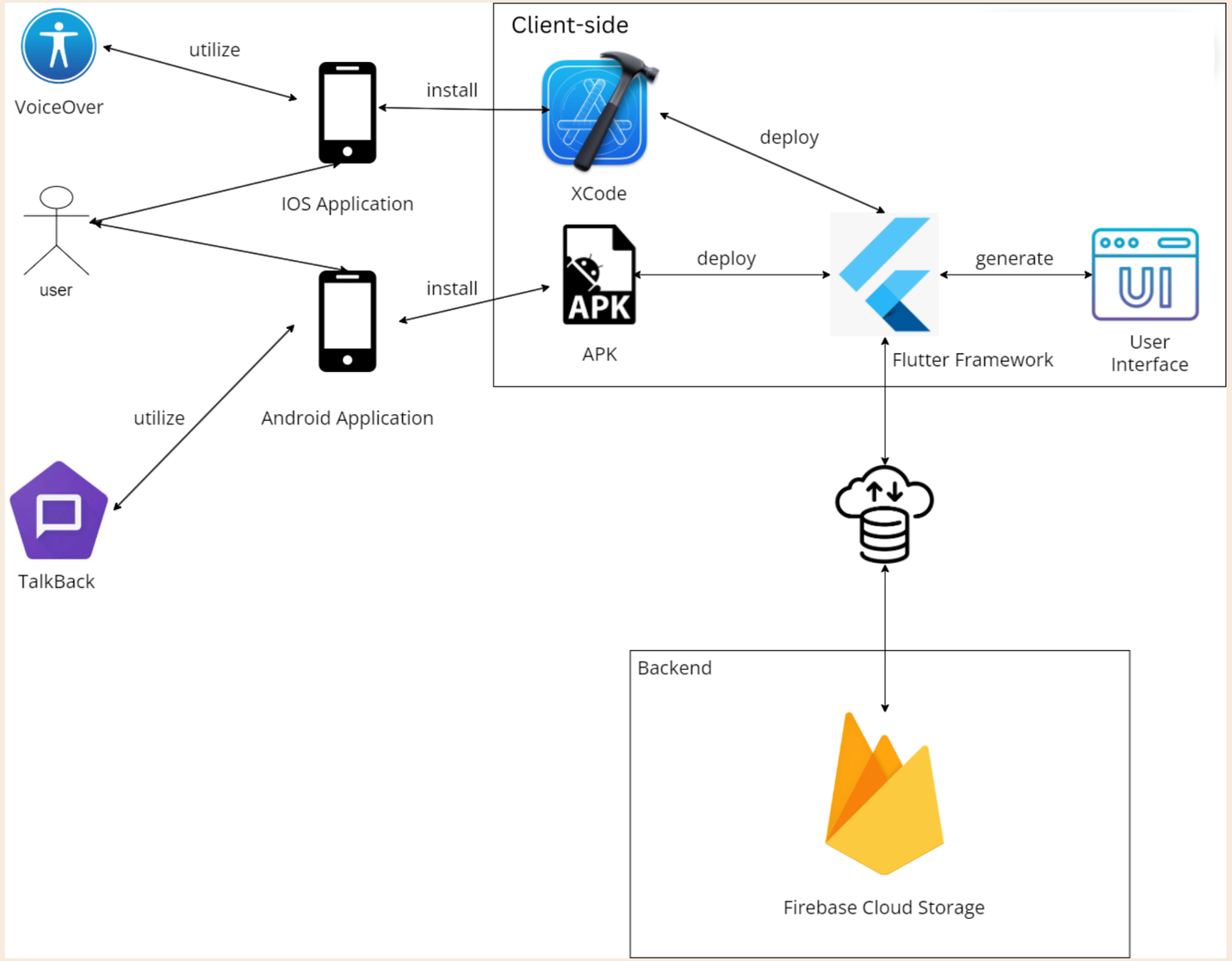
03 Enhances independence, quality of life, and safety

04 Reduces burden on caregivers and family members

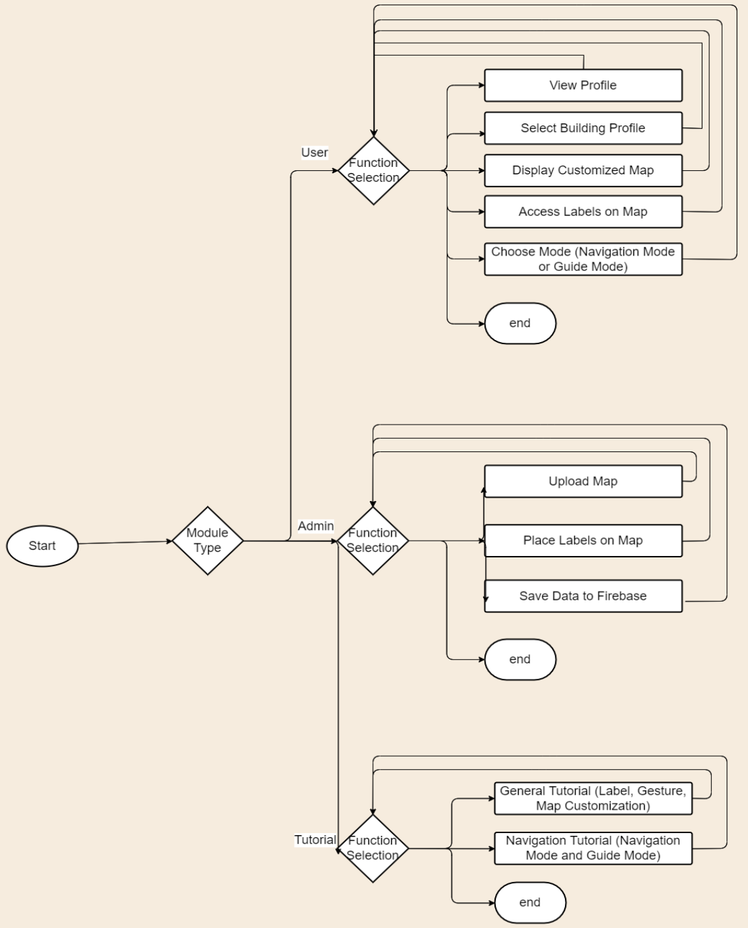
05 Potential for expansion to various structures and settings

System Overview

System Overview



System Overview



Objective Evaluation

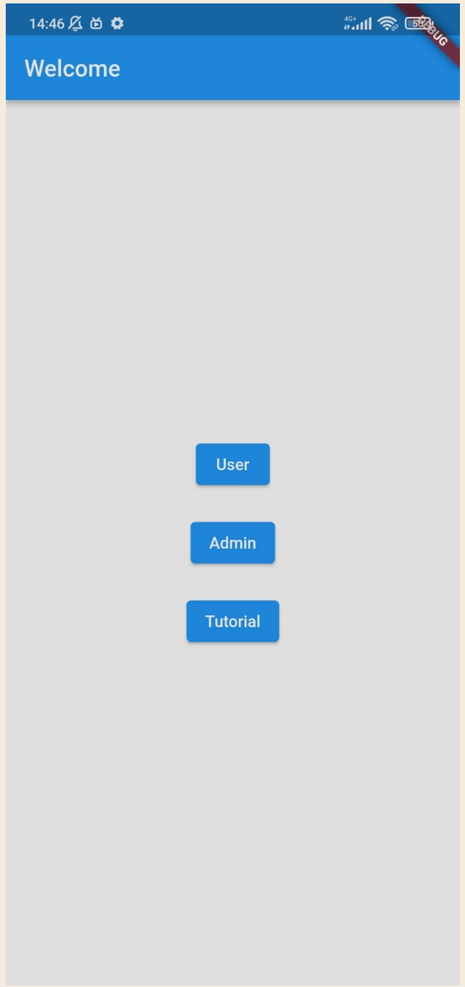
Objective Evaluation

To Create a Cross-Platform Application

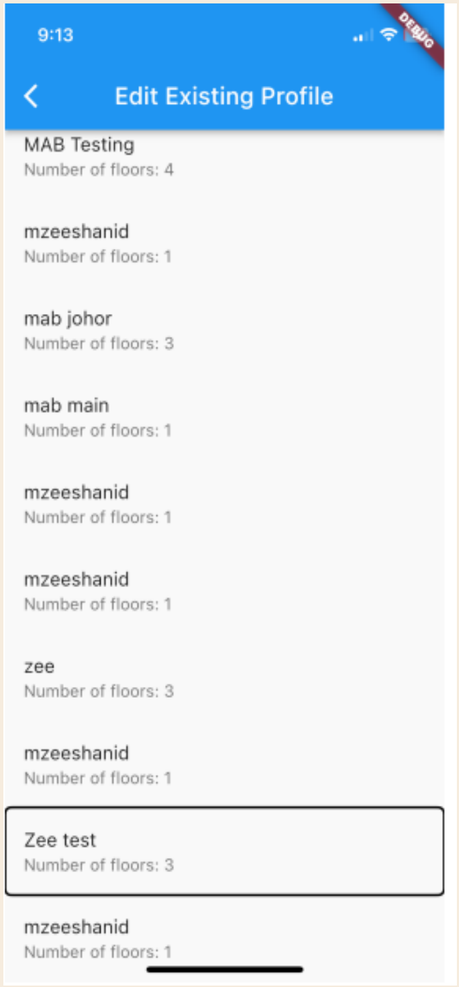
To Develop an Indoor Mapping Component

To Ensure Accessibility Function Compatibility

To Create a Cross-Platform Application



Android



IOS

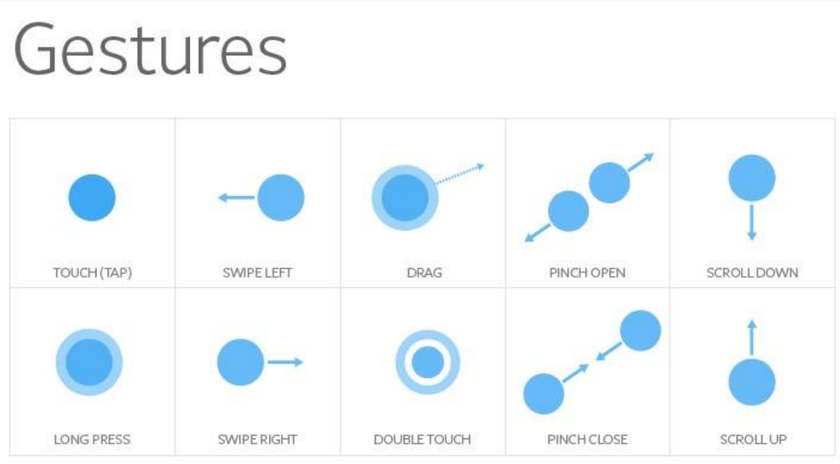
To Develop an Indoor Mapping Component

Function	Evaluation	Criteria
Map Customization	User is able to upload, edit and load the map. Create, edit, remove the labels on the map. Besides, user is able to create, choose, edit different building profile.	Accept
Map Navigation	User is able to navigate the customized map. The two modes and the hint(vibration and audio) are functioning, user can use customized gesture during the navigation.	Accept
Tutorial Module	User is able to learn how to use the application by using the tutorial module.	Accept

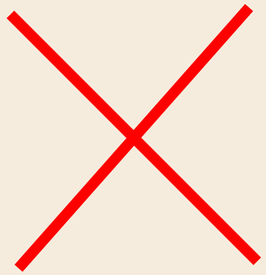
To Ensure Accessibility Function Compatibility

Module	Evaluation	Criteria
Admin Module	The Admin Module is not compatible with Accessibility Function.	Not Accepted
User Module	The User Module is not compatible with Accessibility Function.	Not Accepted
Tutorial Module	The Tutorial Module is compatible with Accessibility Function.	Accept

Challenges



GestureDetector



Accessibility Function

Proposed Solution

Temporarily Disable Accessibility Function
With the help of

Tutorial Mode

Customized Gesture

Application Demo

Q&A