Software Requirements Specification

for

Campus WayFinder Mobile App

Version 1.0 approved

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12/07/2022

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Revision History

Name	Date	Reason For Changes	Version
Yatri Thoria	10/26/2022	Edits in the product scope of the software	0.1
Yatri Thoria	11/30/2022	Edits in the functional requirements	0.2
Yatri Thoria	12/07/2022	Edits in the Non functional requirements	1.0

1. Introduction

1.1 Purpose

The majority of people find it difficult to prospect new areas or unknown locations by themselves. The existing maps of campus can be slightly confusing, sometimes inadequate especially when the classrooms listed in GET are abbreviated. The purpose of this document is to implement a navigation system, as a mobile application that can be used on Cal State LA campus by students and staff, especially newcomers.

1.2 Intended Audience and Reading Suggestions

This project is a navigational system intended for uses strictly inside the college premises. It has been implemented by a team of five and under the guidance of university professor. This project is useful for any user(staff, student, others) as long as they are in some way connected to the university and have a valid student ID and who wish to navigate through the college premises as well as inside any college infrastructure.

This document has technical terminologies and details about the software requirements which will be used in the development of the overall software.. The section External Interface requirements, Requirement Specifications and Other Non functional requirements will be especially used by the development and the testing team. The section Overall Description has information about the functionality and usage of the software in a more general format which will be understandable by users not belonging to the technical domain.

1.3 Product Scope

The scope of this project is to provide its users, the navigation functionality on campus for both outdoor and indoor areas. For this project, all the buildings and landmarks on the Cal State LA campus will have to be mapped out individually, especially for the indoor navigation stage of our solution, including the rooms within them. As this is not feasible given the time constraints, only 1 - 2 buildings will be selected as potential destinations, with a selected few rooms and floors that users can choose from. Augmented reality / textual delivery will be used for the indoor wayfinding stage of our solution.

Once released, users can use it to navigate from any location on campus to another location and can even navigate inside campus building structures. This software does not provide location sharing functionality as of yet but will be later introduced as application enhancement in future releases.

1.4 Definitions, Acronyms, and Abbreviations

This document uses the following Definitions, Acronyms, and Abbreviations:

DB	Database
AR	Augmented reality

1.5 References

N/A

2. Overall Description

2.1 System Analysis

It has been observed that navigating through various areas and buildings of any university for new students or staff becomes quite difficult due to confusing walkways and abbreviations used on the buildings. It leads to delayed commuting from one location to another in college premises therefore making it difficult for students and staff to reach their desired destination on time.

This software aids in providing navigational direction to users to reach from one location to another irrespective of the destination being outdoors or indoors. It is aimed at helping the user to navigate not only outdoors following the walkways but also leading them to desired classrooms/ offices which are generally located inside buildings by providing directions inside the building as well.

The main challenge during the development of this software is to implement the indoor navigation functionality due to unavailability of software requirements.

2.2 Product Perspective

The Campus WayFinder project aims at assisting students and faculty on campus to navigate from one location to another on the premises of the campus as well as inside various buildings of the campus. Our software utilizes the tools such as Android SDK and utilities such as Google's ARCore.

2.3 Product Functions

- Landing Page
- Destination Selection Page
    - Dropdown to select destination
    - Location categories
- Google Maps with directions

2.4 User Classes and Characteristics

This product has 2 levels of functionalities. The features inside the product are accessible to anyone accessing the software with the intention of navigating on campus, and it can be outside on campus premises or inside various campus buildings.

2.5 Operating Environment

This software is intended to run on any android handheld device with active internet connection with Android versions 11 and above.

2.6 Design and Implementation Constraints

The development of the indoor navigation functionality may be impacted due to the unavailability of the floor maps/plans of various buildings on campus with their precise and accurate area measurements. It may also be impacted by the unavailability of free software to develop the indoor functionality.

2.7 User Documentation

This software will not require any user manual since the application is self explanatory.

2.8 Assumptions and Dependencies

- Users are expected to have a functioning Android handheld device
- Users are expected to have Android version 11 and above
- Users are expected to have active and stable internet connection
- Users are expected to have access to Google maps on device

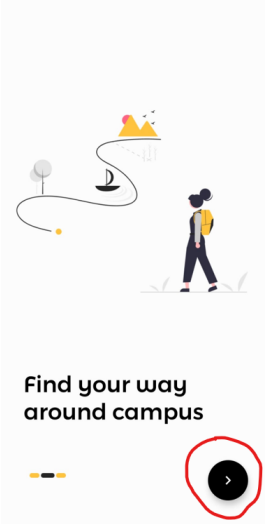
2.9 Apportioning of Requirements

Application will be made specific to campus users in future releases.

3. External Interface Requirements

3.1 User Interfaces

The button to navigate to the next page would be displayed as a black colored button with a right facing arrow.



3.2 Hardware Interfaces

No hardware interfaces.

3.3 Software Interfaces

- Android Studio Dolphin | 2021.3.1
- Unity 2021.3.12f1-Personal

3.4 Communications Interfaces

No communications interfaces used.

4. Requirements Specification

4.1 Functional Requirements

- The system shall run on Android handheld devices with Android version 11 and above.
- The system shall navigate the user on the campus premises.
- The system is not limited for outdoor navigation in just campus premises but outside as well.
- The system shall navigate the user inside buildings as part of indoor navigation.
- The system should allow any user with the software to navigate across the campus.
- The system may only be limited to users having a valid ID of the university.
- The system shall provide all outdoor locations present on campus.
- The system may include only one indoor location for this release of the software.

4.2 External Interface Requirements

The software takes input as the location which the user wants to navigate to and outputs the directions in Google Maps for outdoor navigation.

For indoor navigation, the system takes input of the indoor location and provides the direction via the VR feature displaying arrows for the user to navigate.

4.3 Logical Database Requirements

No logical database requirements.

4.4 Design Constraints

- Mobile Application user requirements:
- Android version 11 and above
- Active and stable internet connection
- Google Maps

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- The application should not take more than X seconds to load
- The mobile application can be accessed by X number of users
- The information type handled is the indoor and outdoor location

5.2 Safety Requirements

To maintain safety, the user is required to not share the location details with other random users.

5.3 Security Requirements

The location data is erased after each time the user uses the software mobile application. Any third-party resources have been checked to maintain privacy.

5.4 Software Quality Attributes

The mobile application is fully functional on all android handheld devices. To successfully run the application, users must enable installation from third party users.

5.5 Business Rules

No Business Rules

6. Legal and Ethical Considerations

- Data privacy
- Allow usage of our service to all skill levels.

Appendix A: Glossary

Android Studio - Android Studio is the official integrated development environment for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development.

ARCore - ARCore, also known as Google Play Services for AR, is a software development kit developed by Google that allows for augmented reality applications to be built.

Unity 3D - Unity is a cross-platform game engine developed by Unity Technologies, first announced and released in June 2005 at Apple Worldwide Developers Conference as a Mac OS X game engine

QR Code - A QR code is a type of matrix barcode (or two-dimensional barcode).

AR - Augmented reality(AR) is an enhanced, interactive version of a real-world environment achieved through digital visual elements, sounds, and other sensory stimuli via holographic technology.