Project Management Plan

for

Project Theia

**Version 1.0 draft 1**

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**Team SSH**

**9/17/2022**

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**Revision History**

| **Name** | **Date** | **Reason for Changes** | **Version** |
| --- | --- | --- | --- |
| Project Management Plan | 9/17/2022 | initial draft | 1.0 draft 1 |
| Project Management Plan | 9/13/2022 | revisions to assumptions and schedule | 1.1 draft 2 |

# Overview

This project aims to create a smartphone application to assist those who are blind and visually impaired who need to navigate indoors. It consists of a navigation component, a contact component in case of emergency, and a usable GUI component. These components will be implemented based on a set of functional and non-functional requirements that will be identified and further refined based on three phases of issue gathering, research, and a prototype build.

Each component can be further broken down into feature sets and purpose. The navigation component will be the most complex and involve a system of locating the user, a series of instructions, voice instruction engine, and an object detection engine. The emergency contact component will be made up of a list of contacts, a communication engine, and a problem detecting engine. Finally, the usable GUI component will connect the above components with the user, designed with the accessibility to be operated by those with lack of vision.

## Project Purpose, Objectives, and Success Criteria

The purpose of this project is for an individual without sight to navigate indoors from one location to another or be able to contact others in case of an emergency. The success criteria will be based on the functional and nonfunctional requirements. If the application can direct the user to where they need to go, successfully detect and notify the user of obstacles, detect emergencies, contact the user or others in case of emergency, and have the app be effectively navigated by those without sight in simulated testing this would constitute a success. For the purposes of this project a full requirements document and prototype must be finished by Dec 11th. Refer to the below section for more information about the scheduled deliverables.

## Project Deliverables

| **Deliverable** | **Delivery Date** | **Delivery Method** | **Comments** |
| --- | --- | --- | --- |
| Project Phase 1: Preliminary Project Plan | September 18 |  | Initialized plan for the plan on roles, separation of tasks in between members and analyzing the risks that might happen during the project. |
| Project Phase 1: Final Submission/ presentation | Oct 16 |  | Revise and finalize the plan for the project together with a collection of meetings with both client and members. Presentation will be made towards the client about the details of the project. |
| Project II: Final Submission | Dec 11 |  | Prototype ready to be presented as a product with features implemented and the app running well. |

## Assumptions, Dependencies, and Constraints

**Primary users**

They can hear, understand, and speak English.

They are reasonably familiar with the building.

They have existing experience using smartphones with accessibility functions, such as pressing home buttons, volume buttons, and making voice commands to the smartphone.

They will need to navigate among different floors, and they are able to operate a normal elevator

(getting in/out, press the buttons, recognize the correct floors, etc.) and/or use the staircases.

They might be using other tools (cane/dog) while using the app, and they are able to operate both.

The user has a smartphone compatible with our chosen design interface Figma and GPS tracking capability.

**Care Takers/Other secondary users**

They are familiar with regular usage of a smartphone app.

They can hear, understand, and speak English.

**Usage Environment**

The app would be used for indoor navigation only.

Navigation is limited for going from one room/location to another, NOT inside each room (finding a chair, a table, etc.)

Obstacles are assumed to be static, such as pillars, trash cans, corners, walls, etc. Moving obstacles (other pedestrians or vehicles, for instance) are outside the scope of the solution.

assume that each room/significant locations are equipped with wireless Beacons that are

capable of communicating with your smartphone/app directly, as in: if the user/phone gets in the range of one Beacon, the phone would receive a signal about “Room 301”; continue walking a little, and the signal would become “Room 302”, etc.

Emergency dial-out is considered necessary.

## References

AymenHakim99. (2021, July 16). *Aymenhakim99/an-android-mobile-application-for-assisting-students-with-disabilities: An Android mobile application for assisting students with disabilities*. GitHub. Retrieved September 17, 2022, from https://github.com/AymenHakim99/An-Android-Mobile-Application-for-Assisting-Students-with-Disabilities

*The Collaborative Interface Design Tool.* Figma. (n.d.). Retrieved September 17, 2022, from <https://www.figma.com/>

Hijazi, H., Khdour, T., & Alarabeyyat, A. (2012). A review of risk management in different software development methodologies. *International Journal of Computer Applications*, *45*(7), 8-12.

Nevin, C. (2022, April 12). *Pioneering accessible navigation – indoors and outdoors*. BlindSquare. Retrieved September 17, 2022, from <https://www.blindsquare.com/>

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## Definitions and Acronyms

GUI: Graphic User Interface

Figma: Figma is a collaborative web application for interface design, with additional offline features enabled by desktop applications for macOS and Windows.

GPS: Global Positioning System

IDE: Integrated development environment (IDE) is software for building applications that combines common developer tools into a single graphical user interface (GUI).

React Native: React Native is an open-source UI software framework used to develop applications for Android, Android TV, iOS, macOS, tvOS, Web, Windows and UWP.

# Project Organization

## Process Model

We plan on using the spiral software model to develop this project with each cycle being the deliverables in each milestone. In the spiral model, we initially gather information and make sure everyone understands the requirements for the project. Next, we outline the requirements with diagrams and flowcharts. The documents being the major deliverable, we will use the time normally allocated to create a prototype to create the documents and to plan the next spiral phase.

## Organizational Structure

The team will use Discord and Zoom for communicating project development. The liaison will communicate any necessary questions to the mentor via Email. Documentation will be shared via Google drive and any code sharing will be done through the Gitlab project set up by our mentor.

## Roles and Responsibilities

Sean will be responsible for setting up meeting times with the mentor and forwarding any questions to the mentor. All members will be responsible for developing the project and documents for each milestone.

| **Project Requirement/Roles** | **Owner** |
| --- | --- |
| Liaison; Developer; Mapping out Functional Requirements. User Manual | Sean Mccord |
| Developer; Mapping out Functional Requirements. Preliminary prototype documents. WRS | Nathan Jackson |
| Developer; Mapping out Functional Requirements. WRS | Connor Hill |
| Developer; Mapping out Non-Functional Requirements. Prototype Interface | Jing Ren Tay |
| Developer; Mapping out Non-Functional Requirements. WRS | Eric Alvarez |

# Managerial Process Plans

## Management objectives and priorities

Our priorities for the management of this project is to ensure an equal distribution of labor in regards to workload. As such, communication is an important aspect of our work. Our team will meet to determine how tasks will be distributed, as well as meeting to ensure the tasks are progressing smoothly before deadlines. A clear objective and direction will improve quality by leaving more time for review. This collaboration at every step will help us reach our objective of creating a quality final product within the specified time frame.

## Assumptions, dependencies, and constraints

Our product is a mobile application that assists blind and visually impared individuals to navigate indoors. We can assume that many of the navigational features need to include audio and tactile cues, so the app will be built around this understanding.

The usability of this application depends on the data relating to the indoor location that must be traversed. Not only this, it also requires an efficient way of tracking the location of the user in real time to ensure accurate directions are relayed.

This also leads into the limitations of such a system, as reaching a ubiquitous domain will be a protracted effort. Thus the primary constraints will remain time and funding, as the most important features will be the most time consuming to implement. There is also the question of software and sensors needed to ensure unimpeded, real time traversal of obstacles.

## Risk management

Concerning risk management for this project, the major steps in our plan will be broken down into probable risks based upon the different risk categories the step relates to as well as possible strategies to mitigate and manage these risks. While it is difficult to account for and handle every risk that may arise in a large, spanning project, reducing individual milestones for risk management allows for greater scrutiny.

| **No.** | **Risk** | **Type** | **Likelihood** | **Description** |
| --- | --- | --- | --- | --- |
| 1 | Failing to meet project deadlines | Managerial | Not likely - High impact | The team will not be able to meet the deadlines set by the client to finish the product or present a deliverable. |
| 2 | Team member has negative impact on project development | Managerial | Moderately likely - High impact | Either through lack of communication with other members or subpar performance, a team member does not perform to the level of the rest of the team. |
| 3 | Change in project requirements | External | Highly likely - High impact | The requirements for the project, such as features, UI and other elements of the project, changes during the development process. |
| 4 | IDE and tools used are not suitable for the project. | Technical | Not likely - High impact | IDE is unsuitable for the complexity required by the project. As such, the project will fail to meet expectations. |
| 5 | Lack of communication or understanding between members and/or clients | Managerial | Highly likely - Low impact | Communication between team members is below baseline, leading to less efficient development. The client’s requirements are harder to implement due to lack of understanding. |
| 6 | Underestimating task for resource allocation | Organizational | Not likely - High impact | Not properly allocating time and team members to a task, putting the schedule at risk. |

*Table 1: Potential risks and their descriptions.*

| **Risk Category** | **Monitoring and Controlling** |
| --- | --- |
| Technical Risks | * Verify that the software used is appropriate for objectives. * Assign the appropriate amount of resources in case of additional requirements |
| External Risks | * Ensure that the product’s features meet all local, state, and federal regulations. * Keep up to date with clients in case project specifications change over time. |
| Organizational Risks | * Verify that team members have adequate time to complete assigned tasks. * Ensure that the correct resources are made available to project team members. |
| Managerial Risks | * Establish clear channels of communication to handle issues as they arise. * Make clear the standards for a professional work environment. * Frequent team-wide meetings to discuss progress and difficulties. |

*Table 2: Table for the monitoring and mitigation of the different risk categories in Table 1.*

# Technical Process Plans

## Methods, tools, and techniques

Our team will be communicating through our preferred method, discord, to set up meetings, discuss project deadlines, and other general communications. We will use GitLab for our version control and to keep all our documentation for the project. We will be using more of a Kanban style approach on this project where we tackle issues as they come at us and focus on planning and completing things in the correct order. As for the project, we will be using React Native to build the application, which primarily uses JavaScript. This will allow us to develop easily for both iOS and Android.

## Software documentation

There are a few documents we will be creating throughout the life of this project. We will create a software requirements specification which covers all the detailed requirements that the application should satisfy; A software design description which describes the architecture and design of the application; Some user documentation will also be created to describe the functionality of the app and how to use it from a user’s perspective.

| **Document** | **Template or Standard** | **Created By** | **Reviewed By** | **Target Date** | **Distribution** |
| --- | --- | --- | --- | --- | --- |
| Project Management Plan | Project Management Plan Template | Sean Mccord, Connor Hill, Nathan Jackson, Jing Ren Tay, Eric Alvarez | Sean Mccord, Connor Hill, Nathan Jackson, Jing Ren Tay | 9/17/2022 | Google Docs |
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## Work elements and Schedule

Tentative Schedule

Phase 1

* Research and initial project plan - Sep 1 - Sep 18
* Identify requirement issues and possible solutions - Sep 19 - Oct 4
* Checkup meeting with Prof - Oct 4
* Create WRS Document and user manual - Oct 4 - Oct 16
* Discuss refining functional and non-functional requirements - Oct 7
* Write-up issues for project and begin WRS section of the WRS - Oct 8-9
* Finish WRS Oct 11, 14-15
* Complete slides for presentation Oct 14-15
* Phase 1 Document final - Oct. 16
* Demo - Oct 21

Phase 2

* Begin Phase 2 - Oct 17
* Checkup meeting with Mentor - Nov. 4
* Final deliverable and demo Dec. 5 - Dec 11