

# **Blind Indoors Navigation System**

## **Preliminary Project Plan**

### TEAM MEMBERS:

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Kanya Krishi  
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# Introduction

## 1.1 Project overview

This project plan will be utilized for the implementation of a system that aids the visually impaired to walk indoors. The project aims at creating a navigation system that safely directs blind individuals to their desired classrooms within the UTD ECSS building.

The smartphone app created on Android platform will:

- Detect the current location of the person within the ECSS building.
- Guide the person by giving voice instructions on the path to the destination.
- Calculates the shortest route to the destination class.
- Offer multiple paths leading to the destination and offer the user a choice.
- Detect objects along the path of the person and give out warnings in case of objects.
- Reach out to the emergency contacts in case immediate assistance is required.
- Minimizes the usage of stairs and looks out for elevators instead.
- Allow the user to bookmark frequently visited locations and routes taken for future use.
- Support integrations with Google assistant to navigate.

The ECSS building map obtained from the UTD Facilities Management will be used for app navigation. A database will be used to store the account information, emergency contacts, offer personalization etc.

## 1.2 Project deliverables

The following are the deliverables for this project:

a) Preliminary Project Plan	-----	Deliverable 0
b) Requirements Elicitation	-----	Deliverable 1
c) Requirements Analysis	-----	Deliverable 2
d) Architectural Design	-----	Deliverable 3
e) Object/Component Design	-----	Deliverable 4
f) App implementation	-----	Deliverable 5
g) App Verification & Validation	-----	Deliverable 6

## 1.3 Evolution of this document

This is the preliminary plan for the project which will be updated as and when required.

Version	Date	Comments
1.0	01/26/2023	Initial Version - Using Template

## 1.4 References

1. <https://personal.utdallas.edu/~chung/RE/Project1.pdf>
2. <https://personal.utdallas.edu/~chung/SP/SoftwareProjectManagementPlanTemplate.htm>

## 1.5 Definitions, acronyms, and abbreviations

- Emergency Contact: A trusted individual added by the user, to whom a call will be placed in case of immediate assistance or 911.
- Favorites: A location/classroom within the ECSS building that the user will frequently visit.

# **Project organization**

## **2.1 Process model**

UML diagrams - sequence, use-case and class diagrams will aid in designing our project. With this we will build a basis for the system, implementation, and a graphical representation using Figma to depict the mockup prototypes that will represent the interaction between various components of the Android application. We will use the Agile method of development for our project.

## **2.2 Organizational structure**

The members involved in developing this project are:

- Aishwarya Singh
- Kanya Krishi
- Kishorekumar Suresh
- Prajwal Manjunath
- Vismaya Maliye
- Suyash Bahrani
- Vaibhav Tyagi
- Sahil Kirpekar

For the first deliverable Aishwarya Singh will be the Team Leader for the project.

## **2.3 Organizational boundaries and interfaces**

This section will be updated as and when the project evolves.

## **2.4 Project responsibilities**

All the team members will be involved in all phases of the project life cycle.

# **Managerial process**

## **3.1 Management objectives and priorities**

### **Timeline chart**

The main activities and milestones involved in the project development process, which generally includes the research and development, design, testing, monitoring, and risk identification, are depicted visually in a timeline chart for project building. The chart frequently includes particular dates or deadlines for each step in the process, and it is frequently organized chronologically. It may be used to give an overview of the project's development, pinpoint problem areas, and organize the activities of the many teams working on the project. Setting objectives, monitoring progress, and identifying any possible risks or delays may all assist in managing the project.

## **3.2 Assumptions, dependencies, and constraints (CADS)**

### **Assumptions**

- Assumed that all the members of the team are available for weekly meetings and updates.
- It is assumed that the required human resource is available for the necessary skill set required for the project.
- Assumed that we have access to all the required resources that would be used in the project.
- It is assumed that the quality/specification of the target milestone is achieved rather than doing it again.
- All the updates and feedback of the project milestone of every week is thoroughly inspected by the team leader.
- It is assumed that the project requirements are fully understood.

## **Dependencies**

### **Logical Dependencies**

No task can be started without completing the previous/ prerequisite task. Also, the prerequisite task should be completed satisfactorily.

### **Resource Dependencies**

There are 8 skilled team members available to work on this project, so there will be some resource dependencies. To avoid that we implement resource leveling and resource allocation so that every milestone is completed at the same time.

### **External Dependencies**

While building the project there may be some external factors due to which it can cater the progress of the project. Also can reduce the quality of the work. To avoid that we would make some pre planned risk management plans so that in case of any emergency we could provide alternative solution as soon as possible.

### **Team Multitasking Dependencies**

To work efficiently and smoothly every member of the team will be provided the timeline chart and resource allocation so that no interference is made. Also, all the resources that will be required for building projects are provided.

## **Constraints**

### **Business Constraints**

Time, quality, and multitasking are the major restrictions on this application. In-depth study and software development cannot be done in the time available. It could impact how well an application works. Each project delivery changes the team roles, which might result in errors. Additionally, the professor has established deadlines for all deliverable materials. It is unbending. Consequently, we must swiftly reach each milestone.

## **Technical Constraints**

We will be building our project on the android platform.

### **3.3 Risk management**

The following table lists potential project problems, their chance of occurring, and suggested risk-reduction measures.

Lack of communication: The team leader coordinates with that team member and passes the updates.

Project Deadline doesn't meet for any member: Team leader makes sure that the required help to complete that task is given. Also other team members collaborate so that the task is finished within the deadline.

Scheduling conflicts: If any team member is unavailable or has conflict at that time, the team leader manages the time. Also, sessions can be recorded if time doesn't meet for one team member.

Complex Technology: If any problem persists, team could come and collaborate and work on each phase

Poor Design: Redesign the architecture and maybe reallocate the tasks to each team member.

### **3.4 Monitoring and controlling mechanisms**

**Monitoring and Controlling Project Work:** The team will assess and monitor the project's current status to ensure that it represents the intended performance goals. The time chart will incorporate this evaluation, which will happen periodically during the project. Each team member will have a better understanding of the project's status, actions taken, and anticipated completion dates thanks to this procedure.

**Monitoring Risk:** In order to manage and control risks, Excel will be used. These plans and tactics can be changed as necessary. As new hazards materialize over time, the prospective team leader will regularly collaborate with the team members to identify and assess them. This procedure will mitigate hazards' effects, if not entirely stop them from happening.

**Monitoring Communications:** The team is responsible for ensuring that the client's necessary project information is clear and that the project's goals are achieved. A separate record that summarizes the important subjects covered in the meeting will be used as necessary, and a meeting minute will be used for communication between team members.

**Scope Control:** The scope control procedure oversees any adjustments made to the project's baseline while keeping track of the project's scope. This ensures that any modifications to the baseline are applied and documented and that the scope baseline remains constant throughout the project.

### **Schedule Control**

The project's progress is updated by the Timetable Control process, which also modifies the schedule baseline as needed to ensure the project's success.



# Technical process

## 4.1 Methods, tools and techniques

### 4.1.1 Methods

We will be following the Agile Development process for building our software. Agile development is a methodology for software development that emphasizes flexibility, collaboration, and customer satisfaction. It encourages the use of iterative and incremental development, where requirements and solutions evolve through the collaborative effort of self-organizing and cross-functional teams. Agile methodologies are often used in conjunction with Scrum, a specific framework for managing and completing complex projects. Agile development is designed to help teams respond to the unpredictability of building software and to deliver working software quickly, while still maintaining a high level of quality.

### 4.1.2 Tools

1. UML modeling: Draw.io
2. UI & prototype design: Figma
3. App Development: Android studio with Ionic Framework / iOS framework
4. Team Website: HTML and CSS
5. Team documentation: Google Docs, Confluence by Atlassian

### 4.1.2 Techniques

We will use lightweight tools and frameworks to support our Agile development process. To keep track of the due dates and project development stages we will employ Scrum technique for timely meetings, use of tools and trackers to aid in the management of the project. We are maintaining MOMs and tracking the individual assigned tasks using tools like Trello to keep track of task owners, current work status and due dates which will help in providing the deliverables on time. The team Scrum meetings and meeting

with the stakeholders at different lifecycle stages of the project will allow us to incorporate feedback by having open communication which will give us more clarity and adjust our deadlines, resource allocation and revisit the requirements if needed.

## **4.2 Software Documentation**

We will be using Confluence by Atlassian for documenting our project. It is designed to help teams organize, collaborate, and share information. Confluence allows teams to create, share, and collaborate on documents, wikis, and other content types.

It also includes features such as task management, calendars, and team directories. Confluence is often integrated with other Atlassian tools such as Jira for issue tracking and Trello for task management. It can also integrate with other tools like Slack, Microsoft Teams, and Google Drive which will help us seamlessly manage our development.

## **4.3 Project support functions**

We need technical and non technical support. For non technical aspect, we require administrative management, document publication and legal counselling in case for licensing the product.

In terms of technical support, we need strong testing and quality assurance to make a successful application for our stakeholders.

## Schedule

### 5.1 Timeline

This project is scheduled to be completed by **05/04/2023** for the final demonstration. The following table shows the timeline of the main deliverables:

Deliverables	Due Date
Preliminary Project Plan	01/25/2023
Interim Project I	03/07/2023
Final Project I	03/23/2023
Interim Project II	04/18/2023
Final Project II	05/04/2023

Timeline Table:

Deliverables	Tentative Due Date	Team Lead	Tools
Preliminary Project Plan	01/25/2023	Aishwarya Singh	Draw.io, Figma, Android Studio with Ionic Framework / iOS framework, HTML, CSS, Google Docs, Confluence by Atlassian

### 5.2 Meetings Schedule

Team Lead: Aishwarya Singh			Meeting #: 1		
Assignments Deliverable	Percentage (in %)	Assigned Date	Due Date	Task Owner	Joined Meeting (Y/N)?
Preliminary Project Plan	12.5	01/24/23	01/25/23	Aishwarya Singh	Y

Preliminary Project Plan	12.5	01/24/23	01/25/23	Kishorekumar Suresh	Y
Preliminary Project Plan	12.5	01/24/23	01/25/23	Kanya Krishi	Y
Preliminary Project Plan	12.5	01/24/23	01/25/23	Prajwal Manjunath	Y
Preliminary Project Plan	12.5	01/24/23	01/25/23	Sahil Kirpekar	Y
Preliminary Project Plan	12.5	01/24/23	01/25/23	Suyash Bahrani	Y
Preliminary Project Plan	12.5	01/24/23	01/25/23	Vismaya V Maliye	Y
Website Design and Hosting	12.5	01/24/23	01/25/23	Vaibhav Tyagi	Y

Signatures for Meeting 1:

*Sahil Prashant Kirpekar*

*Aishwarya Singh*

*Vaibhav Tyagi*

*Suyash Mahesh Bahrani*

*Kishorekumar Suresh*

*Kanya Krishi*

*Vismaya Maliye*

*Prajwal Manjunath*