Project Management Plan

For

Indoor Navigation App for the Visually Impaired

Version 1.1

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Submitted for:

CPTS 484

Project Phase 1

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Revision History

Name	Date	Reason for Changes	Version
1st	9/18/22	Initial Draft	1.0 draft 1
2nd	10/16/22	Revision of Sections 1.2 & 5	1.1

This guidance text is not applicable to the project at this moment

1. Overview

1.1 Project Purpose, Objectives, and Success Criteria

Our team is planning to create a smartphone app to assist blind and visually impaired people so they are able to navigate indoors. The motivation for this project is to help the lives of those who are impacted with visual difficulties. The objective of this project is to build a safe, fast, and comfortable navigation app that can be used exclusively by blind people or their caretakers. This will require us to make the app be usable to a wide range of interactions. Our success criteria is if the app can successfully navigate multiple classrooms, offices, bathrooms, lounges, elevators, etc. Our major deliverables are documentation of the customers and stakeholders vision of the product and the product execution itself. The constraints we are under is time and communication with the customer. The major milestones of this project will include the prototype of the app interface that is able to be used by blind and visually impaired people, and the vision detection technology that is going to be used to allow this app to “show” the user the physical world. The scope of this product is a camera to tactile interface application. The business needs that need to be satisfied are the required customer communication and testing for working out the bugs and certifying the user interface to be as usable as it can be. Business objectives are to produce a functional application to cover a set building layout and type. The application will be considered successful if a visually impaired user can navigate a building layout with obstacles without coming in contact with any of them and being told where the obstacles are.The integration of the product with other products is potentially large with it becoming bundled with other application for the visually impaired but at the current moment is a singular application.

1.2 Project Deliverables

Deliverable	Delivery Date	Delivery Method	Comments
Project Phase 1: Preliminary Plan	9/18/22	Online	Documentation
Project Phase 1: Final Submission	10/16/22	Online	Documentation
WRS Document	10/16/22	Online Doc	User Interface

			descriptions and basic user manual.
Revised Preliminary Plan	10/16/22	Online Doc	Input received was to fix sections 1.2 and 5
Meeting Records	10/16/22	Online Chart	A collection of our meeting records.
PowerPoint Slides for demo 1	10/16/22 Will be used on 10/19/22	Online .ppt	These slides will be used on our phase 1 demo the following week
Prototype of UX	End of Week 5	Online Presentation	Intended to show the version we are working on and to get feedback
Project Phase II: Final Submission	12/11/22	Online	Documentation
Delivery of Finished Application to Customer	12/11/22	Online	Application

***Additional minor deliverables will be completed on the dates shown in the timeline found in section 5

1.3 Assumptions, Dependencies, and Constraints

We will be working under the assumption that the user of the product will be in a lit building and that they are moving their smartphone to scan their surroundings. We will also assume that the user of the product will be using a device that can run the application at top speed with no slow downs because of hardware limitations and with any peripherals that are recommended by the developers.

1.4 References

- Project specification page from reading 1 supplied by Bolong Zeng for our CPTS 484 course
- Python documentation page for AI libraries (Ex. Tensor Flow: https://pythonguides.com/tensorflow/)

1.5 Definitions and Acronyms

- INAVI
    - Indoor Navigation App for the Visually Impaired
    - *Meaning:* This is the shorthand title of our project
- AI
    - Artificial Intelligence
- Agile
    - It is the software process that our team is planning to use that incorporates requirement analysis, design, development, testing and debugging, release, and maintenance.
- XP
    - eXtreme Programming

2. Project Organization:

2.1 Process Model

We will be using an agile software development process model for our project, in specific we will be using the eXtreme Programming(XP) process model. Because the agile model breaks development tasks into smaller iterations, and is designed to help a project to adapt to change requests quickly, it also facilitates quick project completion. Using the agile development process model, we can maintain a close contact with the customer and stakeholders during the lifecycle of the project development, this will help our team obtain a clear understanding of various user's requirements. Each Agile project usually includes a customer representative on the team. At the end of each iteration a prototype of the product will be presented, stakeholders and the customer representative reviews the progress made and re-evaluate the requirements.

2.2 Reasons behind choosing XP as our process model

- Working through Pair programming produces well written compact programs which have fewer errors as compared to programmers working alone.
- It reduces the total development time of the whole project.
- Customer representatives get the idea of updated software products after each iteration. So, it is easy for him to change any requirement if needed.

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2.2 Organizational structure

Team members:

- Wahidullah Rahimi
- Mohammed Al Ahbabi
- Callum MacDonald
- Mitchell Kolb

The team's communication liaison will be Wahidullah Rahimi. All team members will have the developers role. All team members will take part in project documentations based on their assigned tasks.

2.3 Team Meetings and Communication

The team will be using Discord for communications and arranging meetings. Any questions or concerns will be communicated to the professor through WSU official email by team liaison and all team members will be cc. The team will be using google doc for document sharing and working as a team on a single document. The team will use https://gitlab.eecs.wsu.edu/ as a version control system to keep track of changes and code/documents sharing among the team members.

3. Managerial Process Plans

3.1. Management objectives and priorities

Having solid objectives and priorities at the beginning of the project would guarantee the successful development of the project's procedures from initiation to the closure of the project. Since the success or failure of a project is highly dependent on teamwork, project collaboration is the key to success.

3.1.1. Agile nature

We need to carefully study our requirements and make sure they work with our constraints and limitations that we might face in the future. So, our project requirements might be changed and improved accordingly.

3.1.2. Communication

We will make sure that we schedule frequent meetings throughout the week to have a constant clear vision of the project's state and make sure each member is aware of the new changes if there are any.

Note: due to Covid-19 will try to limit in-person meetings as possible.

3.1.3. Stay on track

Continuous project progress re-evaluation is vital for project success. We need to make sure that we follow our planning schedule deadlines so that we stay on track and meet the final deadline of the entire project. Also, that will help to keep a constant work quality throughout the project stages.

3.2. Assumptions, dependencies, and constraints

We need to achieve the project's main goal within the given constraints. The most important project constraints are, **(1) Scope** in that we provide an app for blind and visually impaired people to make their lives easier with the given requirements we specified to be completed within the estimated **(2) time** before the final deadline which is (December 11, 2022), while being of the expected high **(3) quality** and within the estimated **(4) budget.**

Our team would meet from 1-3 times per week depending on the project's state. Every meeting would include planning on what to do next by distributing the work based on the skills and background of each member of the group, and re-study the tasks deadlines and schedule in case we need to modify the current schedule. Also, discussing the work done by making sure that the requirements are met and done in the correct manner. By doing that we would easily stay on schedule and manage the constraints.

3.3. Risk management

No.	Risk	Type	Possibility	Description	Possible solution(s)
1	Missing a deadline	Managerial	High	Not having the time to finish a certain task before the deadline or missing the deadline.	• Frequent meetings. • Changing the deliverables schedule plan
2	Limited resources	Technical	Low	Not being able to apply a feature due to the lack of resources.	• Find an alternative feature or get rid of it.

3	Progress loss	Technical	Low	Losing a chunk of the progress we gained like documents or programming codes.	• Doubling the effort to do it again and push it to the repo frequently
4	Work overload on (a) team member(s)	Managerial	High	Realizing that we didn't divide the work equally between team members after assigning them.	• Redividing the work as soon as possible.
5	Realizing incomplete work after passing the stage	Technical	High	Realizing incomplete pieces of data or finding bugs after we moved to the next stage of the project and finalized the deliverable.	• Assign completing or fixing it in the first next deliverable.

6	Lack of team member's commitment.	Managerial	Medium	One or more members of the group are not finishing the work assigned to them.	int noresponse = 0;
					while (project is going) {
					if (noresponse > 1)
					{
					• Notify the professor and reassign his work between the other members of the group.
					}
					else
					{
					• Notify him
					noresponse ++1;
					} }

4. Technical process

4.1 Methods, tools, and techniques

Python will be the programming language our team will be using to develop the mobile application to help blind or visually impaired people to navigate indoors. Because Python is a high-level, general-purpose and object-oriented programming language that comes with plenty of Artificial Intelligence (AI) libraries.

4.2 Software documentation

Our team will mainly use the WRS template to document the information about the project in the form of text, in addition to this each programmer will document their code.

Records of documentation will also be kept in the team`s GitLab repository.

5. Work elements and schedule

This project is scheduled to be completed by the due date. Here is the roadmap for the project:

- Planning (1 week)
    - Research on daily obstacles for blind people
    - Take suggestions from sources
    - WRS document

- Development (9 weeks)
    - Modeling (2 weeks)
        - Combine research into one document
        - Create a working list of design features
    - Prototyping (2 weeks)
        - Design first iterations
        - Compare designs to get best features
    - Build UI (4 weeks)
        - UI setup
        - Implement best model from prototypes
        - Create different pages as necessary

        - Link different buttons together
        - Create accessibility to each action
        - UI from Phase 1 docs implemented (from the voice dictation to directions)
    - Finalizing (1 week)
        - Finalize/refine any design changes

- Testing (1 week)
    - Test each component of the app
    - This week is interlaced within the Development phase so testing and revision go alongside each other

- Presentation (Week 15)
    - Create a demo for a presentation. Use Phase 1 demo as template for final demonstration.