**Project Management Plan**

**Team 1: Precision Beacon Navigation**

**Tahir Aziz**

**Adeel Khan**

**Sabur Khan**

**Alejandro Guzman**

**Casey Boyle**

**1/27/17**

**ABSTRACT**

This project management plan will outline the team’s process, steps, and required actions that will go into developing and building this Precision Beacon Navigation Project. The goal of this plan is to allow the team to easily understand and see what tasks are needed in order to successfully organize and execute this project so that there is not any wasted time, miscommunication, or misunderstanding.

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**INTRODUCTION**

**Introduction to the entire plan, purpose, and scope of the plan. Brief overview of the product (including purpose, capabilities, scenarios for using the product, etc), description of the structure of the plan**

The purpose of this plan is to clearly list out objectives for our project “Precision Beacon Navigation”. In this plan we will talk about the project purpose, organization, lifecycle organization, hardware and software needed, and an exact layout of how we are going to continue with the project.

The product itself will be one application that will ultimately be used by a person who is visual

Impaired and allow them to walk down hallways without bumping into any walls. For the sake of this project we will begin by seeing if we can walk down a hallway without hitting any walls. We will begin by merging old code, then we will try tracking to see if we can walk down a hall and if the app can track that, then track to see if we can get the beacon to sense us walk down the hall without hitting the wall.

High overview of the structure of our plan:

Initially the scenario where the app will be used will be to make sure the app allows you to walk down a hallway hitting walls or not.

Second the app should be able to visually show as you get closer to the walls.

Third the app should be able to vibrate/make noise and show as you get closer to walls and also tells you as you get closer to the walls.

At this point the app should be able to guide a visually impaired person down a hallway.

**PROJECT ORGANIZATION**

**Describe the way in which the development team is organized, the people involved, and their roles on the project include the rationale**

The project has been organized so that the required work is split up according to the amount of work needed in addition to assigning it to team members who have the skills and desire to work on that part of the project. The goal of this rationale is to make sure more people are assigned to work that is more intensive, and the team members are happy with their role. This project will have multiple people occupying multiple roles because there are many tasks that need to be accomplished as well as the fact that having multiple people checking each other’s work is good to have to ensure a high quality project.

Team Members:

Tahir Aziz

Casey Boyle

Sabur Khan

Adeel Khan

Alex Guzman

Team Roles:

Project Manager: Tahir Aziz

Requirements Engineer: Adeel Khan

Designer: Tahir Aziz

Lead developers: Casey Boyle, Alex Guzman

Developers: Sabur Khan, Tahir Aziz, Adeel Khan

Testing: Adeel Khan

Quality Assurance: Casey Boyle, Alex Guzman, Sabur Khan, Tahir Aziz, Adeel Khan

Rationale:

Project Manager: Tahir is the project manager because he has leadership and management experience through leading the Association for Computing Machinery at UTDallas, and everyone else on the team agreed on Tahir being the project manager.

Understanding the requirements is extremely important since without a proper knowledge of the requirements, we will not know what to build, and as a result we decided to have a requirements engineer role. This will be Adeel since he has experience documenting requirements in projects from other classes.

Designer: Since the end product is going to be used by a specific user demographic, it is important to understand what that is and design the product accordingly. Tahir will work on the interface and experience design due to his background in that field.

Lead Developers: Alex and Casey will be the lead developers on this project simply because they have the most experience in Android development. This is a good role to have because they can guide the rest of the team and explain and make technical decisions that will impact the product, while having the skillset to implement them.

Developers: Sabur, Tahir, and Adeel will be the other developers on the team. Of course, this project is a development project, so everyone will need to contribute to the development of this product.

Testing: Testing the software that is produced is necessary to ensure that there are no bugs and errors in the code. Writing unit tests, and using testing tools are some ways we could test the software. Adeel will be the Tester because of his experience in testing at an internship.

Quality Assurance: While the product is being developed, the team needs to ensure that the product is meeting the functionality and requirements specified by the stakeholders and the requirements document. Since everyone on the team is responsible for the success of the project as defined by the primary stakeholder (the industry sponsor), everyone will have the responsibility of ensuring that the entire product meets quality standards throughout the development process and after the product is complete or ready for submission.

**LIFECYCLE MODEL USED**

**Describe the lifecycle model used include the rationale RISK ANALYSIS describe possible project risks, the likelihood of these risks arising, and the risk reduction strategies that are proposed. Include the rationale.**

We are planning to stick with a regular waterfall model, we have been given the project and requirements will use the SCRUM methodology to help break down work tasks. We will have daily “stand ups” to get a good picture on where everyone is in the project daily, we will also work in small deliverables to make sure there is nothing broken as we try to move forward. Additionally, we will meet on Fridays where we hope to have a product review to demonstrate progress.

Likelihood:

High (H): Very likely to occur

Medium (M): May or may not occur  
Low (L): Low likelihood of occurrence

Possible Project Risks:

Fixing Difficulty :  
  
High (H): Very difficult to fix

Medium (M): May or may not be be difficult to fix  
Low (L): Easy to fix

Possible Project Risks:

Risk (Likelihood, Fixing difficulty)  
1) Old code being unusable in our project and having to start over. (L, H)

2) A team member dropping the class due to X reasons. (L, L)

3) Struggling to figure out proper algorithms needed for project (H, M)

4) Poor team communication, or lack of motivation from team (M, M)

5) Hardware issues. (missing or broken parts) (M, M)

6) Requirements for project change. (L, H)

7) Unable to meet deadlines. (M,L)

8) Hallway is not suitable for our project (H,H)

Risk Reduction Strategies:

1) For the first issue we will try our best to work around the issue and if it does occur we will try our best to scrape whatever code is usable for our project

2) Our team currently has 5 people which leaves a good amount of breathing room, if someone were to drop the class, or become unable to show up due to whatever reason, we should have enough manpower to fill in their place.

3) This is going to be a pretty common problem being unable to figure out exactly what our algorithms are and what they need to do. We will need to work as a team in order to figure out any issues and if needed we can turn to our mentor, or the PHD candidate who is working on this project at a higher level.

4) This happens a lot for many projects some people just become busy with life, other classes pile up and things just happen. Over here this is where the standups come into play, and this is why we are mandating them so people continuously working on the project and we are left accountable for the work we need to get done.

5) There is a chance that something might not be working, for example a beacon might not work, or a phone might be dysfunctional in that case Dr. Tom has offered to get things we need, but hopefully we will be able to work with whatever we need without having to buy any more.

6) This is unlikely but we are trying to work in smaller increments so that if something did end up changing hopefully it won't be too difficult to fix

7) This goes back to good team management, and good communication, we need to work together to make sure things are done on time, and if possible get done early. Also we need good team communication in terms of making sure that if someone is unable to get something done on time, that someone covers for the individual.

8) This seems to be a problem in our project we seem to be doing our project in a hallway where the connection is sometimes faulty and that may be altering our results. We have not fully tried things out yet, but it may be a necessity for us to switch which room/hallway we use to test our beacon/app functionality.

**HARDWARE AND SOFTWARE RESOURCE REQUIREMENTS**

**Describe the hardware and software required to carry out the development. Both hardware and software must be available in the lab. Include the rationale**

Software:   
Android Studio: every individual member should have android studio downloaded on their laptop/desktop

Hardware:

An android phone for at least the lead developers to have to test the application

Beacons: provided by the customer for navigation use

**DELIVERABLES, SCHEDULE**

**Describe the activities, dependencies between activities, the estimated time required to reach each milestone, and the allocation of people to activities. Include the rationale.**

Task List:

1. Team communication and work tools set up.
   1. Attain everyone’s Github usernames for version control
      1. Ensure everyone has accepted their Github invite
   2. Send everyone Trello invites for task management
      1. Ensure everyone has accepted their Trello invite
   3. Send everyone invite invites for Slack invite for communication
2. Understand the existing code bases
   1. Understand the Aruba Beacon Codebase
      1. Share knowledge with the rest of the team
   2. Understand the Walking Navigation Codebase
      1. Share knowledge with the rest of the team
3. Set up local development environment
4. Get both codebases to run on personal device
5. Combine both codebases into 1 new one
6. Understand how the beacons work
   1. Understand how to interface with the codebase created in 5.
   2. Understand how to register the beacons
   3. Understand how the beacons will be used to route paths
7. Code the functionality of the beacons interfacing with 6.1
   1. Register beacons according to 6.2
8. Understand the navigation functionality
   1. Figure out how to store the internal floor layout
   2. Understand how to use RSSI values for beacon precision
   3. Figure out how to display current location of the user
   4. Figure out how to display beacon placement
   5. Figure out how to display step count
   6. Figure out how to give audio feedback to the user
   7. Figure out how to allow the user to store paths
   8. Figure out how to display paths
9. Develop the navigation functionality
   1. Implement 8.1-8.8
10. Design the user interface
    1. Understand the end user demographic and their needs
    2. Design the user interface according to interface guidelines
11. Develop the user interface
    1. Implement 10.2 with the functionality in 7 and 9
12. Quality Assurance
    1. Ensure the product meets all requirements set forth by the customer
13. Participate in daily updates and weekly meetings
14. Participate in useage of team tools: Slack, Github, Trello, Google Drive

Task Details:

1. Task 1
   1. Assignees
      1. Tahir
   2. Time
      1. 2 days
   3. Dependencies
      1. Team members accepting the invites
   4. Rationale
      1. This task is needed to ensure that the entire team is using proper tools for development and communication throughout the project
2. Task 2
   1. 2.1
      1. Assignees: Casey
      2. Time: 3 days
      3. Dependencies: None
      4. Rationale: Casey wanted to take a look at this codebase
   2. 2.2
      1. Assignees: Tahir, Sabur, Adeel, Alex
      2. Time: 4 days
      3. Dependencies: Each of the assignees learning the codebase so that the knowledge can be shared
      4. Rationale: The rest of the team took the responsibility of the this task because this is the more complicated codebase.
3. Task 3
   1. Assignees: Tahir, Adeel, Sabur, Alex, Casey
   2. Time: 1 day
   3. Dependencies: Possible issues affecting installation of Android Studio
   4. Rationale: Everyone needs to have Android Studio on their computer so they can code and work on the project.
4. Task 4
   1. Assignees: Tahir, Adeel, Sabur, Alex, Casey
   2. Time: 1 day
   3. Dependencies: Possible bugs in the existing codebases, Android Studio configuration issues
   4. Rationale: Everyone needs to have the codebases running on their devices to make sure the code works and they can see the result of it.
5. Task 5
   1. Assignees: Lead Developers (Casey, Alex)
   2. Time: 1.5 weeks
   3. Dependencies: Understanding the existing codebases, potential errors in the code,
   4. Rationale: Since merging the codebases is going to be tricky, the lead developers will handle this task
6. Task 6
   1. Assignees: Tahir, Adeel, Sabur, Alex, Casey
   2. Time: 1 week
   3. Dependencies: Beacons not working
   4. Rationale: Everyone needs to know how the beacons work because that is the main part of the project
7. Task 7
   1. Assignees: Tahir, Adeel, Sabur, Alex, Casey
   2. Time: 2 weeks
   3. Dependencies: Beacons not working
   4. Rationale: This is important because this is how the team will make the navigation work. Everyone will have a hand in coding this part so that everyone has good knowledge of how to integrate this with navigation
8. Task 8
   1. Assignees: Tahir, Adeel, Sabur, Alex, Casey
   2. Time: 2 weeks
   3. Dependencies: Beacons not working, issues getting floor plans into the app
   4. Rationale: The navigation is another major part of the project, so everyone should be involved in understanding what needs to be done.
9. Task 9
   1. Assignees: Tahir, Adeel, Sabur, Alex, Casey
   2. Time: 3 weeks
   3. Dependencies: Beacons not working, issues with floor plans in the app
   4. Rationale: This is important because this is the navigation part which is very important to the main goal of the project. Everyone will have a hand in coding this part because it will be time consuming and at the same time everyone will need to know how this functionality works.
10. Task 10
    1. Assignee: Tahir
    2. Time: 1 week
    3. Dependencies: User demographic information, interface constraints from the customer
    4. Rationale: The product must have an interface, and so it must be designed. Tahir will be designated it since he is the designer on the team.
11. Task 11
    1. Assignees: Sabur, Adeel, Alex, Casey, Tahir
    2. Time: 1 week
    3. Dependencies: The user interface design (10).
    4. Rationale: The interface needs to be connected to the functionality and logic of the beacons and navigation. Everyone will work on since this will be closer to the end of the project schedule and tasks will need to be wrapped up quickly.
12. Tasks 12-14
    1. Assignees: Tahir, Alex, Casey, Sabur, Adeel
    2. Time: Consistently throughout the project
    3. Dependencies: Project requirements, and team member participation

Schedule:

1/21- 1/24: Tasks 1, 3

1/25-1/30: Tasks 2, 4

1/31-2/10: Task 5

2/11 - 2/17: Task 6

2/18-3/1: Task 7

3/2-3/15: Task 8

3/16- 3/29: Task 9

3/30 - 4/13: Task 10

4/14-4/20: Task 11

Tasks 12-14 will be continuously done throughout the course of the project

**MONITORING, REPORTING, AND CONTROLLING MECHANISMS**

**Describe the management reports that should be produced, when these should be produced, and the project monitoring and control mechanisms used include the rationale**

1. Project Management Plan
   1. An outline of the project plan
   2. Due on 1/27
2. Requirements Documentation
   1. An in-depth documentation of the requirements the project will have to meet
   2. Due on 2/10
3. Architecture Documentation
   1. A document describing the architecture of the software the team is building
   2. Due on 2/24
4. Detailed Design Documentation
   1. A detailed document going in-depth on the design of the software, modules, interactions, components, etc.
   2. Due on 3/17
5. Testing Plan
   1. A plan that outlines what the team will be doing for testing the project’s code
   2. Due on 4/7
6. Final Project Report
   1. A detailed report on the entire project
   2. Due on 4/28

Reporting Mechanisms: The reports will be written using Google Docs and will be submitted via email to the professor.

Monitoring and Controlling Mechanisms: Each phase of the project roughly corresponds to a management report. Thus, the content and information needed for each report will be gathered as that part of the project is being implemented. As a result, the report content will be monitored by the team members who will already understand what the project details relevant to the upcoming report. The project manager will control the reports and ensure that the reports are satisfactory and that they are turned in on time.

**PROFESSIONAL STANDARDS**

**Describe the expected behavior of the team members related to scholastic dishonesty, meeting schedule and quality expectations for tasks and deliverables. etc. Include the rationale refer to Appendix A for more details**

The team is expected to behave in a professional manner. This project is an introduction to how our life will be in the real world and we are going be acting with that in mind.   
  
We have shared our personal numbers, emails, and have created a slack for our project, we have explicitly arranged meeting times around everyone's schedule so that everyone can attend. We have a policy where a meeting needs at least three people to begin and we will stick to that. As a team we are holding ourselves accountable and are hoping that any problem can be solved internally as a team. We will also keep in mind the management references in regards to the IEEE standards.

We have our “customer” which is ultimately Dr. Tom we understand that he has requirements that need to be met and a certain standard those requirements need to be at as well. We will work together to make a code that not only meets the customer's requirements but also meets his standards as well

With that being said, there is also a knowledge that the end does not justify the meaning that we will not resort to scholastic dishonesty in any way. We will work hard at keeping ourselves and each other in check and make sure that we know exactly where the code is coming from, and if needed we will cite any of the sources we use to further our project.

**EVIDENCE THE DOCUMENT HAS BEEN PLACED UNDER CONFIGURATION**

We are using Google docs to make sure all our documents are being typed out in a way that everyone can contribute. At the same time we are using Trello to keep track of activities and Slack for communication. All our google documents and their links are sent on to our slack and can be sent to the professor very easily.

**MANAGEMENT REFERENCES**

Complete, correctly formatted using IEEE standard Appendix A. The following provides a professional standards guideline for the teams. This guideline may be tailored. The professional standards must be agreed upon by each member in the team. Guideline: On the first occurrence of unacceptable behavior, determine the circumstances involved, resolve the problem, and document the event in the meeting minutes. On a second occurrence, notify the instructor of the problem. A meeting will be set up to evaluate the situation and resolve the problem. On a third occurrence, again notify the instructor of the problem. A meeting will be set up to evaluate the situation and resolve the problem. At this point, the team will have the \*option\* of removing the team member. If removed, then the team member receives a prorated grade based on the number of weeks they have participated in the group. Examples of unacceptable behavior may include not delivering on time, delivering poor quality work, missing team meetings, being unprepared for team meetings, disrespectful or rude behavior, etc. Reasons such as "too busy" or "I forgot", or "my dog ate my design model" are unacceptable. Valid reasons that must be considered include those listed for obtaining an incomplete standing in a course (illness, death in the family, travel for business or academic reasons, etc.)