CptS 484: Software Requirements

Software Project Management Plan

Team Moderamen

Austin Marino

Cole Bennett

Freya Varez

Sean Cornia

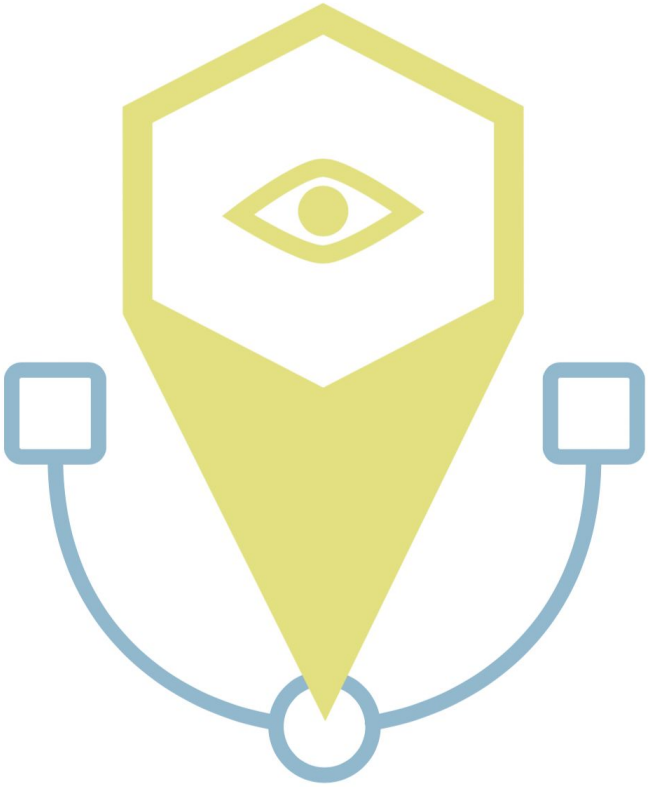


Table of Contents

Introduction

The Software Project Management Plan (SPMP) describes the planning, organization, and staff involved in the Moderamen mobile application. This document provides an overview of how our team will manage the project; including, deliverables, schedules, dependencies, and assumptions. The SPMP will also break down the people behind the application, their roles, and ideas for the project.

Project Overview

We are team Moderamen, and our goal is to provide a service for the visually impaired that will increase their ability to navigate inside of buildings safely. We hope to achieve this goal by developing a mobile application for both iOS and Android, which will provide both visual and audio cues that will direct our users to their desired location with ease.

Project Deliverables

The project has had various deliverables for Phase I and Phase II, which include...

Phase I Deliverables

Deliverable	Due Date	Grade Weight
Project Plan & Meeting Records	October 13th, 2019	15%
World Requirement Specification (WRS) Document	October 13th, 2019	25%
Software Project Management Plan	October 13th, 2019	25%
Prototype & User Manual	October 13th, 2019	15%
Prestation	October 13th, 2019	20%

Phase II Deliverables

Deliverable	Due Date	Grade Weight
Final Project Plan	December 8th, 2019	10%
Process Specification	December 8th, 2019	10%
Vision document	December 8th, 2019	20%

WRS document for the product	December 8th, 2019	30%
Final presentation Functional Prototype	December 8th, 2019 December 9th, 2019	30%

Evolution of Document

The SPMP is now in its final stage, version 2.0, and will include the final specifications and breakdown of our current system and how it came to be. The SPMP now holds within its scope a full description of the Moderamen application, scheduling of deliverables, a clear description of the team structure, and our overall evaluated risks. The scope of the plan establishes a clear outline for the members responsible for a particular stage of the project development, as a reference document for the entire development of the project. Additionally, the document has great importance in providing a basis for the history of activity reports; since this plan is an active document and has been revised during all development stages of the project.

Revision History

Version	Date	Notes
1.0	September 8th, 2019	Project Phase I: Preliminary Plan
1.1	October 13th, 2019	Phase I: Revised Preliminary Plan
2.0	December 8th, 2019	Phase II: Final Project Plan

References

Our references are listed as footnotes at the bottom of pages where one or more have been used.

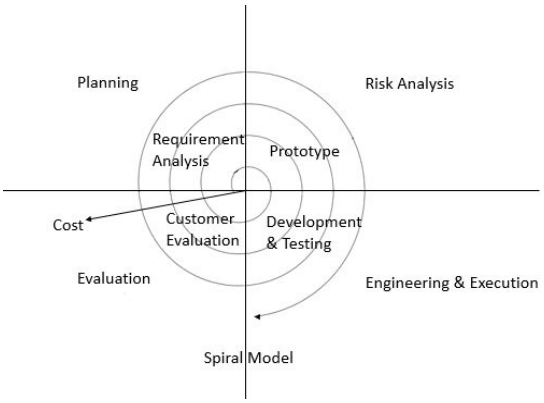
Definitions, Acronyms, & Abbreviations

SPMP: Software Project Management Plan
WRS: World Requirement Specification
RE: Requirements Engineering
iOS: Mobile operating system created and developed by Apple Inc. exclusively for its hardware
Android: Mobile operating system based on a modified version of the Linux kernel and other open source software, designed primarily for touchscreen mobile devices such as smartphones and tablets.

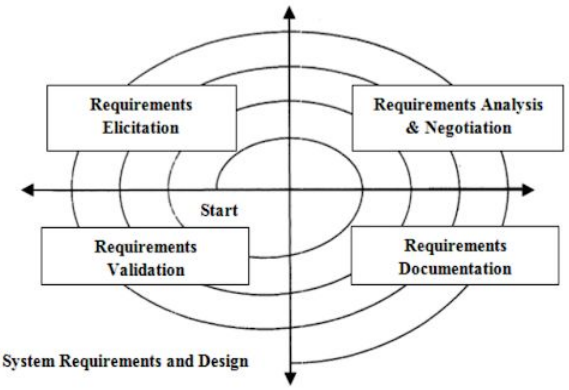
Project Organization

Process Model

The Moderamen team uses the Spiral software development method because it is iterative by nature, like the requirements engineering process. This fundamental structural similarity between the two processes allows them to work well in unison during the development of software. Our team follows the RE (featured on the right) process during the "Planning: Requirements Analysis" section of the Spiral method (featured on the left). Additionally, the Spiral method emphasizes risk analysis in order to reduce any unwanted or unforeseen adverse outcomes from arising. There is also a review period at the end of each iteration to reevaluate what new features or updates should be proposed for the next iteration, RE, which avoids wasted resources and money.



Spiral Model[1]



RE Process[2]

Organizational Structure

The Moderamen team is composed of four individuals and thus does not need a complex hierarchy. We rely on all four individuals working in tandem with one another to ensure we produce the highest quality of work possible. The central oversight comes from the team liaison, Austin, who ensures that the whole team is staying on pace with the outlined schedule the team unilaterally agreed on. Each significant milestone is broken up into separate tasks and equality partitioned amongst the group. During our weekly meetings, we conduct code/document reviews to ensure that each member of the team met their goals. The image below shows the minimalist structure the group is broken up into.

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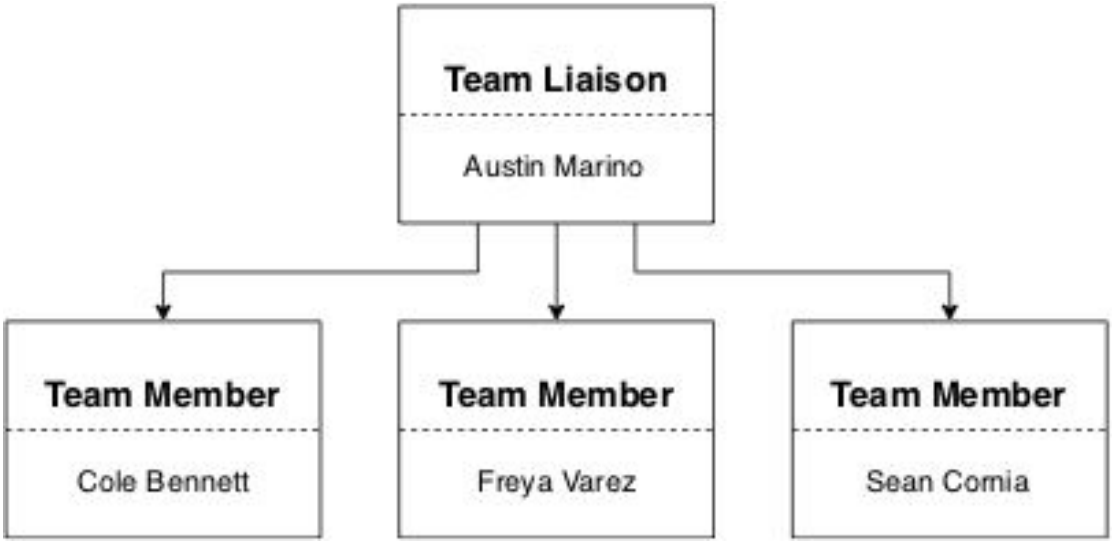
[1] Naveen. "What Is Spiral Model in Software Testing and What Are Advantages and Disadvantages of Spiral Model." Testing Freak, January 30, 2015. http://testingfreak.com/spiral-model-software-testing-advantages-disadvantages-spiral-model/.

[2] "Requirements Engineering Processes, Tools/Technologies & Methodologies." Google Sites. Accessed August 5, 2019. https://sites.google.com/site/richchihleese/home/se-research/requirements-engineering-processes-toolstechnologies--methodologies?tmpl=/system/app/templates/print/&showPrintDialog=1.



Organizational Boundaries & Interfaces

Austin Marino - Team Liaison / Developer

Austin's role is as the team liaison and software developer. He communicates with all stakeholders, such as Bolong Zeng, and parlays project information back and forth between his team and outside clients. When Austin is not communicating with clients, he is assisting his team in the development of their project's documents such as the SPMP, Process Specification, and IDEF0.

Cole Bennett - Developer

Cole's role is as a software developer. He spends most of his time working alongside his other teammates, developing software and creating and revising the documents that guide their development process. His main tasks for Phase II include working on the Moderamen mobile app, the final presentation, non-functional requirements modeling using KAOS, and on the IDEF0.

Freya Varez - Developer

Freya's role is as a software developer. She spends most of his time working alongside her other teammates, developing software, and creating and revising the documents that guide their development process. Her main tasks for Phase II include working on the KAOS Model and Vision document.

Sean Cornia - Developer

Sean's role is as a software developer. He spends most of his time working alongside his other teammates, developing software, and creating and revising the documents that guide their

development process. His main tasks for Phase II include working on the Moderamen mobile app and the final presentation.

Project Responsibilities

<table>
<tr><th>Project Phase</th><th>Deliverable</th><th>Component Breakdown</th></tr>
<tr><td>Project Phase I</td><td>Preliminary Plan</td><td>
<table>
<tr><th>Component</th><th>Assignee</th></tr>
<tr><td>Introduction</td><td>Sean Cornia</td></tr>
<tr><td>Project Organization</td><td>Austin Marino</td></tr>
<tr><td>Managerial Process</td><td>Freya Varez</td></tr>
<tr><td>Technical Process</td><td>Cole Bennett</td></tr>
<tr><td>Work Elements, Schedule & Budget</td><td>Austin Marino</td></tr>
</table>
</td></tr>
<tr><td>Project Phase I</td><td>Final Submission</td><td>
<table>
<tr><th>Component</th><th>Assignee</th></tr>
<tr><td>WRS Introduction</td><td>Austin Marino</td></tr>
<tr><td>WRS Preliminary Definition</td><td>Sean Cornia
Freya Varez</td></tr>
<tr><td>WRS Issues with Preliminary Definition Given</td><td>Sean Cornia
Freya Varez</td></tr>
<tr><td>W and RS</td><td>Austin Marino
Cole Bennett
Sean Cornia
Freya Varez</td></tr>
<tr><td>Preliminary Plan Revisions</td><td>Austin Marino</td></tr>
<tr><td>User Manual</td><td>Austin Marino
Cole Bennett</td></tr>
<tr><td>PowerPoint Presentation</td><td>Freya Varez
Cole Bennett
Austin Marino</td></tr>
<tr><td>Hand Drawn Prototype</td><td>Cole Bennett</td></tr>
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<tr><td></td><td></td><td><table><tr><td>Digital Mockups</td><td>Cole Bennett</td></tr></table></td></tr>
<tr><td>Project Phase II</td><td>Final Submission</td><td><table>
<tr><th>Component</th><th>Assignee</th></tr>
<tr><td>Final Project Plan</td><td>Austin Marino</td></tr>
<tr><td>Process Specification (IDEF0)</td><td>Austin Marino</td></tr>
<tr><td>Vision document</td><td>Freya Varez</td></tr>
<tr><td>Updated WRS Document for Product</td><td>Austin Marino
Cole Bennett
Sean Cornia
Freya Varez</td></tr>
<tr><td>KAOS Modeling</td><td>Cole Bennett</td></tr>
<tr><td>User Manual</td><td>Austin Marino
Sean Cornia</td></tr>
<tr><td>Final presentation</td><td>Cole Bennett
Sean Cornia</td></tr>
<tr><td>Functional Mobile Application Prototype</td><td>Cole Bennett
Sean Cornia</td></tr>
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Managerial Process

Management Objectives & Priorities

Moderamens is, first and foremost, a medical device - classified under FDA guidelines of a *Mobile Medical Application*.[3] With this classification comes various regulations that we must abide by before deployment; in addition to the requirements set forth by stakeholders. As team liaison, Austin, will remain in contact with all dependent parties to assure new information and guidelines are communicated with the development team.

The development team must design and implement a user-friendly, extensible application within the allocated budget, time, and specified quality. The Moderamen team will be less focused on agility - and more on testing and redesign.

[3] "Mobile Medical Applications" (United States Food & Drug Administration, September 4, 2018), https://www.fda.gov/medical-devices/digital-health/mobile-medical-applications.

Assumptions, Dependencies, & Constraints

Assumptions

1. Moderamen will be usable for visually impaired users (primary stakeholders) as well as non-visually impaired users, including caretakers, emergency response, etc. (secondary users).
2. Moderamen is to be used strictly indoors or between buildings, in its current state.
3. Funding has been approved for research and development.
4. Necessary equipment and software are available for use by the Moderamen team.
5. A team of 4 is available for development and communication.

Dependencies

1. Moderamen must have access to blueprint layouts of buildings in order to ensure the safe navigation of the user.
2. Moderamen app can successfully locate the user's device through a viable internet connection.
3. The Moderamen team has enough members to complete the tasks assigned.
4. The Moderamen team has enough time to complete the tasks assigned.
5. The tasks assigned experience little change/creep.

Constraints

1. Moderamen must be available for use by consumers using iOS and Android devices.
2. Moderamen must be available across language barriers and as ubiquitous as possible for users.
3. Moderamen must follow FDA guidelines.

Risk Management

Risk Type	Risk	Probability	Description
Market Risks	Market saturation	Medium	One or more applications are available that compete with ours causing financial non-viability.
Financial Risks	Over-budget	Low	Insufficient planning or changes in requirements cause the project to run over-budget.
Technology Risks	Data corruption or loss	Low	Unforeseen loss of proprietary resources caused by system corruption or improper use of version control tools.

	Insufficient hardware or OS	Low	The final app is unsupported on a customer's phones due to operating system issues or unforeseen hardware restrictions.
People Risks	FDA disapproval	Low	The application does not follow FDA regulations and guidelines - it is not approved for deployment.
	Software leads to injury	Medium	Software is unable to warn users of potential obstacles around them causing possible injury/harm.

Monitoring & Controlling Mechanisms

Risk	**Monitoring & Controlling Mechanisms**
Market saturation	Significant preemptive research will be done before development is progressed to assure that this product has a financially viable customer base.
Over-budget	Planning is conducted before and throughout the development lifecycle to ensure the requirements and budget is stable.
Data corruption or loss	Git-based version control will store codebase and documents to a globally accessible server, in addition to local repositories.
Insufficient hardware or OS	Using an open-source mobile application framework, React Native, our app will be designed and tailored to successfully run on devices using the iOS or Android operating systems.
FDA disapproval	The research will be done at all stages of the Moderamen development cycle to determine the feasibility of the app concerning FDA restrictions. The team liaison will keep track of all FDA guidelines to ensure these regulations are met.
Software leads to injury	Significant (re-)testing will be done to ensure the application has a low failure rate.

Technical Process

Methods, Tools, & Techniques

The project will be implemented using the Spiral software process model. Following the methodologies of Spiral, we will perform a review process at the end of each deliverable lifecycle. Version control systems (GitLab) will be utilized as a primary means for enforcing code reviews through pull requests and branches. Semantic Versioning 2.0.0 will be utilized as the versioning scheme for the project, which entails that we conform to the *MAJOR.MINOR.PATCH* format.[4] Each phase, feature, and bugfix will hold their own branch:

- Each phase, indicating a major version increase, will have its own branch. All features (minor version increase) and bug fixes (patch version increase) associated with a phase will be merged into this branch.
- A formal review process will be performed for each feature and bugfix: A pull request to merge (or rebase) a feature/bugfix into a phase branch must be opened. All team members must review and approve the request for it to be accepted.
- At the end of each phase, an additional pull request must be opened to merge the phase branch into master.

Software Documentation

Documentation of the project will be present in the following ways:

1. All functions, classes, and variables of importance will be associated with concise and descriptive comments, formatted according to the industry standard conventions of the programming language(s) chosen for the project.
2. Markdown and PDF files will be utilized as the formats for documentation files in the project repository. The following documents will be included:
    a. A readme document containing general information and installation/build steps.
    b. A user manual document describing how to use the application from an incoming user's perspective.
    c. Software Requirements Specification defining functional and non-functional requirements, and also use cases of the application.
    d. WRS document outlining all requirements, stakeholder and general inputs that will play a part in the formation of our application.
    e. Any other documents that will further provide insight on our developmental process and deliverables.

[4] Preston-Werner, Tom. "Semantic Versioning 2.0.0." Semantic Versioning. https://semver.org (accessed September 6, 2019).

Project Support Functions

Technical support of the project will include testing, configuration control, and quality assurance:

1. Testing of the application will be derived from the project's requirements specifications.
2. Software configuration control will be facilitated by Git for program, requirement, design, and version release changes.
3. Quality assurance measures will be taken to validate that our application is adhering to the requirement specifications.

Work Elements, Schedule & Budget

Schedule

The Moderamen team has methodically planned out our schedule to ensure we remain on track to meet all deadlines and requirements to minimize unforeseen scope creep.

Team Meetings

We have meetings from 5:00 pm to 6:00 pm every Wednesday; however, we continuously communicate using Slack.

Project Phase I

Preliminary Project Plan	September 8th, 2019
Checkup Meeting	September 18th, 2019
Final Submission	October 13th, 2019

Project Phase II

Final Submission	December 8th, 2019
Final Presentation	December 9th, 2019

Budget

The Moderamen team is happy to report that we maintain a budget of zero dollars throughout the entirety of the semester. We achieve this feat by only using open source tools and software that we discovered through word of mouth or research conducted by team members.