Greenworks Eco Map

Technical Design Document

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Section 1: Abstract

Subsection a: Objectives

The objective of this project is to develop a map-based web application that will be accessible through web browsers. The map will display points that are of interest. Points of interest will be related to green technology and events.

Subsection b: Motivation

The motivation for this project is to increase the visibility of green technologies in Orlando.

Section 2: Code Policy

1. Do not push a bunch of files at once.
2. If you discover a bug, document it, and write a unit test for that bug.
3. Readable code is better than clever code.
4. Always test your changes before pushing to GitHub.
   a. Backend changes: verify that all unit tests pass.
   b. Frontend changes: double check in the browser.
   c. Frontend changes: verify mobile compatibility.

Section 3: Project Stakeholders

Subsection a: Team Members

Jason Castillo Reyes

Matthew Drennan – CO-LEAD

Beethoven Marhone

Ethan Nephew – CO-LEAD

James Rolon

Samuel Soares Walton

Subsection b: External Parties

Dr. Macon

City of Orlando IT

Section 4: Requirements

Subsection a: Legend

Term	Definition
Actor	Who the requirement pertains to
Adm	Client-side actor who will maintain the web application database
Dev	Server-side actor who will develop the web application
User	Client-side actor who will access the web application
A#.#	Requirement ID pertaining to Actors of type “Adm”
D#.#	Requirement ID pertaining to Actors of type “Dev”
U#.#	Requirement ID pertaining to Actors of type “User”

Subsection b: Admin Requirements

Requirement ID	Requirement	Actor
A1.0	**Access to web application**	**Adm**
A1.1	Secure web-based portal	Adm
A2.0	**Data Validity**	**Adm**
A2.1	Ability to view and edit database data	Adm
A3.0	**Interactivity**	**Adm**
A3.1	Login and logout	Adm
A3.2	Controls for creating, updating, inserting, and deleting data	Adm
A4.0	**Map**	**Adm**

Subsection c: Developer Requirements

Requirement ID	Requirement	Actor
D1.0	**Access to web application**	**Dev**
D1.1	Develop on Java platform	Dev
D1.2	Apache Tomcat server for development	Dev
D1.3	Host on City of Orlando server for production	Dev
D2.0	**Data Validity**	**Dev**
D2.1	Admin panel	Dev
D2.2	Build back-end that processes and saves data into a database	Dev
D2.4	Reject improperly formatted data	Dev
D2.5	Feature for bulk data insertion/load	Dev
D3.0	**Interactivity**	**Dev**
D3.1	Implement back-end calls with Jakarta Server Pages	Dev
D3.2	Implement display with HTML, CSS, and JavaScript	Dev
D4.0	**Map**	**Dev**
D4.1	Display points of interest on map	Dev
D4.2	Implement point filter based on point type	Dev
D4.3	Implement point filter based on event day	Dev

Subsection d: User Requirements

Requirement ID	Requirement	Actor
U1.0	**Access to web application**	**User**
U2.0	**Data Validity**	**User**
U3.0	**Interactivity**	**User**
U3.1	Control the type of data points that will be displayed	User
U3.2	Control which event day will be displayed	User
U4.0	**Map**	**User**
U4.1	View location points displayed on the map	User
U4.2	View event points displayed on the map	User

Section 5: Project Schedule

Subsection a: Key Dates

1.	Planning Documentation	–	Jan 31, 2022
2.	Prototype	–	Feb 17, 2022
3.	Test Plan	–	Mar 4, 2022
4.	Beta Versions	–	Mar 18, 2022
5.	Beta Test	–	Mar 28, 2022
6.	Developer Documentation	–	Apr 19, 2022
7.	Final Release	–	Apr 28, 2022

Subsection b: Phases of Development

1. Planning Phase
    a. Create Plan Documents
2. Prototype Phase
    a. Feature Prototype
    b. Refinement & Refactoring
    c. Unit Testing
    d. Documentation
3. Testing Phase
    a. Pre-Beta Integration Testing
    b. Pre-Beta Performance Testing
4. Beta Phase
    a. Demonstrate Wide Application Performance
    b. Verify Requirements
5. Developer Documentation
    a. Finalized User Manual
6. Project Finalization
    a. Submit Final Project

Subsection c: Phase Objectives

1. Planning Phase Objective

    Obtain a teamwide understanding of the project requirements.

2. Prototype Phase Objectives

    Develop an operational web application that fulfills the basic user and admin requirements. Refine features, refactor the code base, implement unit testing, and complete Javadoc.

3. Testing Phase Objectives

    Verify that the user and admin requirements have been fulfilled. Verify that the project satisfies performance metrics. Code base finalization should be achieved by the end of this phase.

4. Beta Phase Objectives

    All components will be functional. The product has reached a presentable state. All requirements have been met satisfactory standards.

5. Developer Documentation Objectives

Completion of a rigorous user manual for the product.

6. Project Finalization Objectives

   The project is completed and shippable. The project will be hosted on a website.

Subsection d: Development Technologies

Software that will be used to complete this project:

- Java SDK
- Visual Studio Code
- Eclipse IDE
- MySQL Workbench
- PhpMyAdmin
- Microsoft 365

Section 6: Risk and Mitigation

Phase	Risk	Impact	Analysis & Mitigation
Planning	Scope creep	High	Refer to planning documents and supported documents to enforce project requirements.
	Lack of clarity	High	Present the point with one of the co-leads for clarity.
Prototype	Undeveloped feature	Medium	Consult Dr. Macon and find a solution.
	Improper use of push	Low	We will be implementing a code policy.
	Workflow problems	Medium	Bring up the problem in the group chat. One of the co-leads will assist with troubleshooting and resolution.
	Inability to effectively unit test	Medium-High	Refactor the code base and extract logic out of super methods.
	Code documentation is insufficient	Low-Medium	Identify areas where revision is necessary and form a strategy for addressing these areas.
Testing	Integration tests fail	High	Review the program logs and verify that unit tests are passing. Isolate the problem origin so a targeted approach can be attempted.
	Performance tests fail	High	If our web application doesn't meet performance metrics, then we will need to deconstruct the components of our system and find ways to increase efficiency.
	Bug Detection	Low-High	Bugs will likely be detected during this phase. For each discovered bug we will document it and write a unit test for that specific bug.
Beta	Missing requirement	High	It will be mission critical to implement all missing components at this stage.
	Application is not operational	High	Consult Dr. Macon and find a solution. At this point, this will likely mean that we have failed our project goals.
Developer Documentation	Overly complicated instructions	Medium	If our installation method is too complicated, we must implement measures to simplify the process.
Project Finalization	Server deployment problems	High	Contact our IT sources.
	Bug discovered after deployment	Low-High	Replicate the bug and discuss with team.