Team Big Data

Litter-Where

Date: 9/15/2022

Team Leader: Joseph Armas
Team Members: Joshua Gherman
Rhoy Oviedo
Frank Curry
Ghabrille Ampo
David DeGirolamo

Git Repository: https://github.com/JosephArmas/cecs-491A-Team-Big-Data

Version History

Current Version: V1

Previous Versions:

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Overview

As our global population exponentially grows, waste will become an environmental problem that will affect the whole world. Our environment is getting close to reaching our planet's limited resources each day and can eventually be inhabitable. Litter-Where aims to give access to users who can report waste in public places and dispose of unused junk items. Litter-Where provides people a map to ping the location of waste in the area in which a clean up event can be set up by communities or ping the location of junk items for others to pick up/dispose properly.

Target Audience

People at the age of 14 and over that live in California are targeted to use Litter-Where to help their community decrease waste. Environmental organizations will have better access to finding accurate polluted areas through the Litter-Where map. Junk items will also be available to users who want their clutter picked up and salvaged or disposed of by the community trash service.

Project Value

Litter-Where is designed to solve heavily littered areas by effectively raising awareness on our current polluted environment. We advocate communities to clean and decrease waste through our interactive map. Litter-Where aims to create a healthier environment where oceans and lands can be in their best condition.

Project Scope

Team Big Data will create Litter-Where as a single page web application with a map. The project will require research from the development team as well as the creation of the website features. The website will require hosting by a third-party host *AWS*. The project will be completed no later than May 10, 2023 as a functional web application. The final product will have the source code on Github and accessed via a http link. Users will get a product that has functional login, logout and user management. Moreover, users will have the ability to view an interactive litter map of California and interact with it by adding, marking or deleting a pin. In addition, users are able to filter the map to their preference and upload images in reference to areas of high litter or list junk items for donation. Active users have the option to be notified when a litter pin has been dropped within their area.

Language

The supported language we will be delivering is *en-us*.

Units

Support for *Imperial System* units.

Supported Clients

Users will need to use a browser to access the application. Recommended: Chrome 104.x (64 bit)

Targeted Audience

Users have to be at least 14 years of age and a California residence to create an account.

Time Zone

The displayed time zone will be in *PST.*

Timeline

Task	Due Date	Milestone
Business Requirements Doc	October 5, 2022	
High-level Design	October 5, 2022	1
Project Plan	October 5, 2022	
	November 9, 2022	2
	December 15, 2022	3
Final Product release	May 10. 2023	

Product Scope

Our Litter-Where stands alone as the sole provider of California's first *litter map*. The product provided would be the first community-driven litter map able to accurately pinpoint places of interest in California that are health hazards to the environment.

Common Components:

Login - Allows users to access their account on Litter-Where. Users can access their account with the proper credentials (a valid email and 8-32 character password) submitted to the login prompt.

Logout - Allows users to exit their account on Litter-Where. A logout button is provided for users to exit their account.

User Management - Allows for users to create, recover, update, and delete their account. Users will be prompted to input a valid email address when registering an account following a password of their choice. In cases where a user forgets their password, users will be able to reset their password by inputting their email address that was used in registering an account. After creating an account, users have the option of updating their profile.

User Access Control - Ensures the user's account has the authorization to do the action they want. These actions include logging in, logging out, adding a pin to a litter site, uploading photos of litter, and clearing pins.

Logging - This feature will keep a trail of records when users are interacting with the web applications and are pinning to the map and marking areas that have been cleaned up. Every pin will consist of global coordinates, date and time when a user adds, deletes or marks as clean. Events created by users will be logged with the time, date.

Log Archiving - The logging will be archived using Microsoft *SQL Server* 2019.

Error Handling - Errors are likely to come from the input of the user. These could include any kind of information inputted into the map or login information. Errors with the Login feature will display “Password is invalid” when input incorrectly and “Email is not found” when a user improperly inputs their email. When a runtime error occurs the application will halt and the user will be prompted with a warning that an error occurred. The error will be sent to the log for the active session it occurred in. A user feedback feature will allow the users to report any form of errors that arise when using the application.

Analytics - Keep track how long a user is on Litter-Where and how often a user is interacting with the website counting the number of uploaded images and dropped pins within a week.

App Features:

Show a Map of Littering in the Area - Display a map that shows hot spots of littered waste within California using *Google Maps JavaScript API*. A primary feature of our application, it directly shows the areas that need to be cleaned.

Add Pins of Littering Sites - Users have the option to drop pins on the map, in order to report areas with high levels of trash. Users can place another pin 30 seconds after placing a different one to limit users from flooding the system with pins. This feature is necessary for users to report litter and is our main source of data in creating the litter map.

Upload Pictures of the Trash - Users have the option to upload pictures of the trash pile. Supported picture files are .jpg or .png and are less than 5MB in data. This feature shows users the amount and spread of the trash pile at the pin location.

Marked Pins as Cleaned-Up or Delete Pin - Areas that have been cleaned up will then be marked with a “cleaned-up” pin. This feature will show the progress of areas that have been reported with high levels of trash.

Filter Map - Users have the option to filter the map by Pin Type:
Litter pins - User left pins indicating areas of litter.
Cleaned-Up pins - Recently cleaned up areas of litter.
Group Event pins - Organized events would be shown.
Junk Item pins - Usable items dropped off on the side of the roads or in public spaces would be shown.
This feature helps users visually see the preferred pins on the map

List Address of Pins Closest to the User - Users in a particular area will see pins that reflect areas with high trash or users listing junk items for pick up. This feature helps users to get rid of or donate junk items that are no longer needed.

Alerts Recently Added Pins Nearby - Users will be notified of recently added pins around their area. Alerts can be toggled on or off. This feature helps users keep up to date and have the option to participate with pins near a particular user.

Project Projection

Risks

A potential risk of the application would be the liability of trespassing on any private property that had been mislabeled as public. In addition, users may lead to a conflict when arriving at the same time at a location of a listed junk item with another user who is also interested in the junk item. On the other hand, there is a risk of users entering misinformation.

Costs

The main cost of Litter-Where is free since we will be using *AWS* to host the IIS Web Server.

Resources

Resources needed for Litter-Where; Visual Studio Code as the *IDE* using JavaScript and C# languages. AWS to host our *Windows IIS Web Server*. SQL as the Database. Team Big Data will be the developers for the project.

Competitors

CalRecycle

As our leading competitor, CalRecycle's value and what they add for the environmentalist community is that they provide a way for their users to find the nearest recycling center. CalRecycle uses government funding to provide a map of recycling centers, but that is all they do for the public. [1] CalRecycle does not provide the litter map that we are providing. CalRecycle, being a government website, is unlikely to implement a litter map since doing so would require sufficient propositions to enact the research of data. Our Litter-Where collects data for the litter map straight from individuals and does so for free.

Facebook

Facebook is a potential competitor, in regards to event planning. A feature that Facebook has is planning events for any purpose [2]. Since Facebook has a large user base, 2.93 billion users according to Statista [3], they can attract more attention to causes such as beach clean-ups. However, our product provides more than event planning. The main value of our product is the litter map, something that Facebook is unlikely to provide. Facebook is unlikely to create a litter map similar to our application because the percentage of their user base that would use the feature would be very small.

Litterati

A similar product to ours, Litterati is a mobile app that shows users a map of dirty areas [4]. When the user picks up trash they can label where they found the trash. The app does not provide the map freely as ours will. The data would have to be requested from the company to see the impact. Literrati finds value in using the idea of picking up trash as an art form. Their goal is to collect data on specific localized trash in locations rather than creating an actual publicly available litter map.[5]

Vision

Future Scope

Aside specifically just in California, we aim to influence the rest of the United States to keep the world a cleaner place. We would like to collaborate with established government organizations to set up volunteer work for areas with high liter piles. In the future robots can be developed to automatically clean up littered areas marked in Litter-Where.

Future Features

When expanding to other states, we aim to add a filter by state feature. A future feature implementation of services nearby in a particular area that can help collect junk items. A points feature can be implemented in the future to entice users to report littered areas and can be saved up for rewards. Dedicating an app for the option of using our Litter-Where on mobile devices (*Android* and *iOS*).

Glossary

AWS - Amazon Web Services which provides on-demand cloud computing platforms and APIs.

En-us **-** This annotation refers to the English language using United States colloquialism.

Google Maps JavaScript API - Google developed code to implement Google Maps onto the website.

Imperial System - Using measurements of feet, inches, pounds, ounces, etc.

Litter Map - A geographical map of waste found on the streets.

SQL Server - A database management system, specifically developed by Microsoft.

PST - Pacific Standard Time.

IDE - Integrated Development Environment.

Windows IIS Web Server - Windows Internet Information Services Web Server aim to host a website.

Android - Operating System used in Android phones.

iOS - Operating System used in Apple iPhones.

References

https://github.com/JosephArmas/cecs-491A-Team-Big-Data

[1] “Beverage Container Recycle Centers.” CA.gov. https://www2.calrecycle.ca.gov/BevContainer/RecyclingCenters/. (accessed Sept. 16, 2022).

[2] “Facebook.” Facebook.com. https://www.facebook.com/events. (accessed Sept. 16, 2022).

[3] “Number of monthly active Facebook users worldwide as of 2nd quarter 2022.” statista.com. https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/. (accessed Sept 16, 2022).

[4] “Download the Litterati App and Fight Litter with Data.” Keep Massachusetts Beautiful. https://keepmassbeautiful.org/what-we-do/litter-prevention-cleanup/use-the-litterati-app-to-target-litter-hotspots.html. (accessed Sept 16, 2022)

[5] Ted. This app makes it fun to pick up litter. (Dec. 2016). Accessed: Sept. 17, 2022. [Online Video]. Available: https://www.ted.com/talks/jeff_kirschner_this_app_makes_it_fun_to_pick_up_litter.