Environmental Issue Reporter

SW Engineering CSC648/848 Section 01 Spring 2018

Team 05

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Milestone 1

28 February 2018

Revision Number	Name	Date
1.0	Initial Design Documentation	2/28/18

Executive Summary

In this day and age, environmental issues should be prioritized as we progress as a society. Our web application offers a solution to getting regular citizens and elected officials involved in working together to troubleshoot the environment in a familiar way. We use social media everyday to speak to our loved ones, find second hand materials, and seek criticisms of local restaurants and businesses. Why not provide a social media way to save the planet? Our platform allows people to communicate issues in a way people are already familiar with about environment hazards with each other and also to get in contact with city officials on ways to resolve complaints that would otherwise pile high on an unpaid intern's inbox in city hall.

Most government environmental reporting websites feel like a chore to utilize, difficult to navigate through, and look like they were designed in 2005. We aim to build a visually appealing web application that will incentivize its users to visit on a daily basis by gamifying being active in the community by mimicking a social network scheme, something most internet users today are already familiar with. Instead of giving the users a chore with the feel of doing government paperwork, users shall be able to post quickly and easily to provide the government information about the environment and get in contact with city officials. Furthermore, users shall be able to search for results relevant to their communities and shall be given an opportunity to comment on local issues or subscribe to environmental news local to their area. Lastly, users shall be given an opportunity to personalize their own profile and get to know other community members and leaders in their neighborhood that they would otherwise never interact with.

Our team of environmentally conscious software engineers is a top notch group of seniors from San Francisco State University. We are based in the Bay Area and understand the need for attention to the environment. It is not enough to implement top down solutions such as a ban on plastic bags or a tax on unclean vehicles. We want to provide a means for a bottom up solution from within the community. This web application shall allow citizens to take responsibility for the earth in their own hands and work together to keep our planet clean.

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Use Cases

Browsing through the website to search for environmental issues

George is looking for alternative sources of income and decides to invest a new home to rent out. He decides that he wants to find a nice place in California. Unsure of where to look, he searches online for areas where the environment may be favorable for renting out and finds a website that displays a list of environment issues with filters that target the areas he's interested in living in and a nice user interface. After browsing the list of environmental issues and history, he takes notes of areas that have bad environmental issues using the sites heatmap and places that might cause trouble in the future for his home.

Registering a new account to to become a registered user

George has enjoyed the experience he has had with this website's posts about environment issues and he wants to become more proactive an engaged with the website's community. He provides an email address and creates a password. George is now a registered user and can post about environmental issues, comment on existing issues, and update his profile. He includes some information about himself and provides a photo of him in a snazzy hat on the beach to represent him on the website for his avatar.

Posting about environmental issues as a registered user

Martha is a mother of two and decides to take her children to the park one afternoon. At the park, she is immediately in disgust after seeing industrial waste dumped on the playground from the nearby factory. She takes a photograph, goes home, heads to the environmental issues website she is already registered in, and begins writing a post about what she saw. Martha writes a paragraph about the park's issues, includes the address of the park, and uploads a photograph to prove what she saw. After she posts, other people on the website can view the current condition of the playground.

Reporting posts that are spam as a verified user

Debbie is a verified user and self proclaimed community leader in her neighborhood. She posts frequently on the environmental issues website and is quite active. Earlier, she was able to verify where she lived and who she was to the site admin. She is granted the position of being a moderator for the website due to her upstanding record of being active on the website. One day, Debbie notices a spam robot was posting advertisements about the local vape shop, an incorrect use of the website. She reports the advertisements and they are immediately taken down for spam. With Debbie's help, the site is more filtered from spam or inappropriate posts.

Updating the status on an environmental hazard as a city official

Edward is a city official that wants to be more hands on with his community members. He registers for an environmental issues website and is able to email his credentials to a site admin in order to verify that he is a city official. Edward notices a post about industrial waste at the local park from a nearby factory. He promptly begins a city investigation into punishing the

factory for tarnishing a beloved neighborhood playground. He is able to report on the post about the city's current progress in making sure the factory dumps its industrial waste in a more appropriate manner.

Subscribing to area specific environmental issues as a registered user

Susan is a busy mother of three in a suburban neighborhood. She is a registered user on a website about environmental issues. She does not have time to regularly check the website for updates, but she still wants to occasionally browse it for issues pertaining to her neighborhood. Susan subscribes to news about her city on the website so that any new information about her area is immediately displayed on the screen. Susan can now she issues about her city without having to search for it or dig through the website's many other environment issue reports.

Data Definitions

Avatar	A small image used to depict a user profile in posts and comments that may be a preset provided by the website or a custom uploaded image
Ban	A status applied to a user that will limit their ability to use features of the website that registered users normally have. This status is applied to users that violate the site rules or show abusive behavior.
Bio	A section of the user profile that displays text input by the user that describes them.
Captcha	Used to deter bots from accessing site features. It is a small puzzle in which the user is asked to verify that they are human by the task of transcribing an image of words into text.
City Official	Special account for a city official or a representative of a city official. Can make official announcements.
Comment	Text submitted by users to provide extra information or their opinions on posts.
Filter search	An advanced search that will query results limited by keywords, date, original poster, or location
Message	private text sent from registered user to another registered user
Notification	in-site notifications popup in the site header, notifying users of new posts depending on their preferences.
Post	A environmental issue submitted to the site by a registered user
Profile	Page for each user that displays user information, posts, comments, bio, and other information.
Registered user	A user with an account, not necessarily logged in.
Report	Users notify the site of inappropriate posts by choosing to report.
Subscribe	Users can subscribe to posts or areas, allowing them to receive in-site notifications or emails of new posts.

Verified user   A logged in user who has verified their identity

Functional Requirements

1. Unregistered Users
    Unregistered users are users who are without an account, but are still capable of browsing posts on the site
    1.01 Users shall be able to register
    1.02 Users shall be able to sign up using email, FB, or Google
    1.03 Users, who sign up using email login, shall be required to use complex password
    1.04 Users shall be required to create a name and a username
    1.05 Users shall be required list the general area they live in the profile
    1.06 Users shall be required to agree to age restriction of 13+
    1.07 Users shall be required to agree to TOS
    1.08 Users shall be able to browse
    1.09 Users shall be able to filter search by area
    1.10 Users shall be able to filter search by issue type - tag
    1.11 Users shall be able to filter search by date - chronologically, or specific date
    1.12 Users shall be able to filter search by person
    1.13 Users shall be able to filter search by keyword in post - limited to area/timeframe
    1.14 Users shall be able to filter search by pages
    1.15 Users shall be able to browse a heatmap of issues

2. Registered Users
    Registered users are users who have an account with the site, and login to perform higher functionality than unregistered users
    2.01 Users shall have capabilities as unregistered users
    2.02 Users shall be able to post about environmental issues
    2.03 Users shall be able to include images and location in posts
    2.04 Users shall be able to comment on posts
    2.05 Users shall be limited to 100 characters in comments
    2.06 Users shall be able to be become verified users
    2.07 Users shall have a profile page
    2.08 Users shall be able to create a bio, max-limit of 500 chars.
    2.09 Users shall be able to create avatars or use one of the preset avatars
    2.10 Users shall be able to plug in their social media: FB, Twitter, Instagram & Linkedin
    2.11 Users shall be required to specify the location
    2.12 Users shall be required to list tags that relate to the environment issue - limited
    2.13 Users shall be to able to upload pictures, max-limit of 4 pictures
    2.14 Users are required to write a description, max-limit of 300 chars

2.15 Users shall be able to disable comments

2.16 Users shall be able to comment on posts

2.17 Users shall be able to flag posts

2.18 Users shall go through captcha to send a message

2.19 Users shall be able limited messages from an area

2.20 Users shall be limited in messaging text only

2.21 Users shall be able to report messages they receive

2.22 Users shall not be allowed to message City Officials

2.23 Users shall be able to subscribe to comments, but only if their own post

2.24 Users shall be able receive email updates on new comments

2.25 Users shall be able to receive notification on site on new comments

2.26 Users shall be able to subscribe to areas by area code, city, county

2.27 Users shall be able to subscribe to any new post or weekly/daily updates

2.28 Users shall receive a strike if their post is reported and removed

2.29 Users shall be banned if they receive 3 or more strikes

3. Verified Users

Verified users are users who have verified their identity and address, and have the capabilities of registered users with the added ability to moderate

3.01 Users shall have capabilities as registered users

3.02 Users shall be able to delete posts and comments

3.03 Users shall be able to disable comments

3.04 Users shall be able to display real name and verified symbol

4. City Official

City Officials are special accounts run by a city official or a representative, and has special posting abilities

4.01 Users shall have capabilities as registered users

4.02 Users shall be able to link official environmental report website

4.03 Users shall not receive messages from other users

4.04 Users shall have extra information on a unique profile

4.05 Users shall be able to post official statements that stand out from regular posts

4.06 Users shall be given a city official account by a site admin

Non-Functional Requirements

1. User data shall be stored in a MySQL AWS RDS instance
2. User password shall be hashed with SHA-256 and a salt
3. User shall not be allowed to use a temporary email
4. User shall not try logging in too many times to avoid server overload and hacking
5. Database shall always be available and independent of the online servers
6. User password shall be hashed on the server before comparing to password in DB
7. User session shall be tracked with cookies
8. Non Registered user shall be redirected to login page if attempting to perform a registered user task
9. Google Analytics shall keep track of traffic and page usage
10. Server shall be part of a load balancer to assure uptime and quick response
11. Server shall not store any user data or important data on its internal system
12. Server shall be easily replicable to ensure uptime in cases of increased traffic
13. Server shall be accessed through SSH only
14. Browsing capabilities shall be the most heavily prioritized feature
15. Search results shall be limited to avoid overloading database
16. Site shall contain a consistent theme using bootstrap
17. Email notifications shall be sent using AWS SES and an official domain name email
18. Email notifications shall be limited to 10 per day to avoid being triggered as spam
19. Messages shall be stored as text and vetted for SQL injection code
20. Messages shall be stored in their own table to avoid overloading other tables
21. Messages shall be deleted after 1 year to avoid a large database table
22. Posts shall be limited to text and a certain number of images
23. Post images shall be stored in an AWS S3 bucket
24. Posts shall not be too long to cut down on storage and reader boredom
25. Comments shall be stored in the same location as the post text to reduce retrieval from multiple tables
26. Comments shall be limited to text and vetted for SQL injection code
27. Reports shall be stored in a table with information on the post
28. UI shall be simple and intuitive

Competitive Analysis

	Nextdoor	EPA	Broward	OEHHA	Us
Map - Heatmap	+	-	-	+	+
Map - Show posts	-	-	-	-	+
Browse	+	-	-	-	++
Post	++	+	+	-	++
Comment	+	-	-	-	++
User account	+	-	-	-	+
Verified user	-	-	-	-	++
Profile	+	-	-	-	++
Notifications	+	-	+	+	++
Likes on posts	+	-	-	-	?
Polls	+	-	-	-	-
Helpful resources	+	+	+	+	-
Refer	+	-	-	-	-

The advantage of our website over existing government websites for reporting environmental issues is that ours is more of a social media platform rather than a reporting system. Users can subscribe, post, and comment about issues and have their own profile, much like Nextdoor. This will incentivize the users to be more active in the community and to use the website more often as it resembles social media platforms that they have already adopted. In addition to gamifying the process of reporting hazards, we are also providing a way for verified city officials to interact with their constituents in a more hands on manner. This shall allow the city officials to react to environmental concerns more quickly and to bring public attention to the current progress of any ongoing city action on environmental hazards.

High-Level System Architecture

- Amazon Web Servers - EC2
- Amazon Linux
- Amazon Relational Database Systems
- Python 3.4
- Django 2.0.2
- Google Analytics
- Supported browsers: Google Chrome, Firefox, mobile
- Google Maps API
- Google Captcha

Utilizing Amazon's AWS services and Elastic Cloud Computing, we shall host the web application on an Amazon Linux machine. In addition, all of our databases will also be stored on Amazon's Relational Database Systems. Our backend architecture will run on Python 3.4 utilizing Django 2.0.2 as a web framework that will easily allow us to implement Bootstrap as a front end architecture. Furthermore, to keep track of website metadata from users, we will implement Google Analytics as a solution. In order to reach the larger share of the market, we shall support Google Chrome, Firefox, and mobile browsers. In order to display a visual component of the environmental hazards in an area to users, we shall implement a Google maps component in our website. Lastly, to deter bots from utilizing our web services for malicious needs, a Captcha puzzle will be required for certain actions.

Team

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Checklist

Checklist Item	Status
Time slot to meet	Done
Github master chosen	Done
Agreement on SW Tools and Deployment Server	Done
Backend Framework	Done
Frontend Framework	Done
Final M1 Agreement	Working On