Antenna Scan
Discover Signals, Uncover Connectivity.

Mapping cellular antennas

GIS Project

Hila Mendelson

Characterization document: Mapping cellular antennas

1. Background

The current process of locating cellular antennas in Israel involves inefficient manual searches on various websitesor through information accumulated from various sources. there is need for advancedand user-friendly solution in this field.

2. Purpose of the project

The goal of the project is to develop a comprehensive mapping application focusing on cellular antennas. The app will provide users with real-time information about antenna locations, safety status and other relevant details. The main goal is to streamline the process of accessing vital information related to cellular infrastructure.

3. Choosing platforms / development tools for the project

1. Web Development: developing a web application using HTML, CSS, and JavaScript for the frontend.
2. Leaflet.js: integrating Leaflet.js library for displaying interactive maps and handling geographical data.
3. Python: For server-side functionalities, using Python, including libraries like Flask or Django for building the backend.
4. Database: employing a database management system to store user data and antenna information from data.gov website.

4.Project design

4.1 Database structure

Column Name	Data Type	Description
ID	Integer (PK)	Primary key
Company	String (varchar)	Name of the company operating the antenna site
Site Number	Integer	Unique identifier for the antenna site
City	String (varchar)	City where the antenna site is located
Site Address	String (varchar)	Address of the antenna site
Local Authority	String (varchar)	Local authority responsible for the site
Jurisdiction Area	String (varchar)	Jurisdiction area of the site
X Coordinate (X_ITM)	Decimal	X coordinate of the site location
Y Coordinate (Y_ITM)	Decimal	Y coordinate of the site location
Site Type	String (varchar)	Type of site (e.g., ground tower, rooftop)
Construction Permit Date	Date	Date when the construction permit was issued

Column Name	Data Type	Description
Activation Permit Date	Date	Date when the activation permit was issued
Last Periodic Inspection Date	Date	Date of the last periodic inspection
Radiation Permit	String (varchar)	Indicates if there is a radiation permit for the site
Maximum Radiation Intensity (µW/cm²)	Decimal	Maximum radiation intensity measured at the site
Maximum Result Percentage (%)	Decimal	Maximum result percentage in relation to health threshold
Description of Point Where Maximum Result	String (varchar)	Description of the point where the maximum result was obtained
Construction File	String (varchar)	Link to the construction file document
Activation File	String (varchar)	Link to the activation file document
Broadcasting Technology	String (varchar)	Technology used for broadcasting at the site

4.2 Schematic screens

1. Map Interface (Home Screen):
   This screen displays the map interface with antenna markers representing different mobile companies coverage areas. Users can interact with the map to toggle between layers, search for locations, and access additional information by clicking on antenna markers.
2. Login Screen:
   The login screen allows users to authenticate themselves by entering their credentials, such as username and password. It provides a secure access point for registered users to access personalized features and functionalities.
3. Enrollment Screen:
   The enrollment screen enables new users to create an account by providing necessary details such as username, email address, and password. It facilitates user registration, allowing individuals to access exclusive features and participate in community interactions.
4. Rating and Opinion Screen:
   This screen allows users to submit ratings and opinions regarding mobile reception in their area. It provides a form or interface where users can rate their experiences with different mobile companies and share their feedback or comments.
5. Thank You Message Screen:
   After submitting ratings and opinions, users are directed to a thank you message screen acknowledging their feedback. It expresses gratitude for their participation and encourages continued engagement with the application.
6. Search Box by Location:
   This screen enhances the rating and opinion submission process by incorporating a search box feature. Users can enter their location details to provide accurate feedback based on their geographical area.

4.3 Types of users

Administrator:
An administrator is a user with maximum privileges on the system. They can add, edit, and delete information, as well as manage other users.

Standard user:
A standard user has basic permissions and can search for and view information in the system. They can also add ratings and reviews.

User ID:
Each user is required to provide a name, email, password for identification within the system.

4.4 Use cases

Standard user usage cases:

1. View Antenna Locations:
    - As a standard user, I want to view antenna locations on the map interface to identify the coverage areas of different mobile companies.
2. Toggle Between Layers:
    - I want to toggle between layers representing different mobile companies to view specific company data and coverage areas.
3. Search for Locations:
    - I need to search for specific locations using the search box feature to locate antennas in a particular area.
4. Access Additional Information:
    - I want to click on antenna markers on the map to access additional information such as company name, site address, and other relevant data.
5. Submit Ratings and Opinions:
    - If authenticated, I can submit ratings and opinions regarding mobile reception in my area, providing feedback on my experiences with different mobile companies.

Administrator use cases:

1. User Management:
    - As an administrator, I can manage user accounts, including creating, updating, and deleting user profiles.
2. Content Management:
    - I have the authority to manage content displayed on the application, including adding, editing, or removing antenna locations and related data.
3. Review Ratings and Opinions:
    - I can review ratings and opinions submitted by users regarding mobile reception in their area and take appropriate actions based on the feedback.
4. Monitor Application Activity:
    - I can monitor application activity, including user interactions, feedback submissions, and any reported issues or concerns.
5. Address User Queries:
    - I am responsible for addressing user queries, providing assistance, and resolving any issues or inquiries raised by users.
6. Continuous Improvement:
    - I collaborate with the development team to identify areas for improvement and implement enhancements to the application based on user feedback and technological advancements.

4.5 Application Activity:

1. User Interaction:
   - Users access the Antenna Scan application through a web browser.
   - Upon accessing the application, users are presented with the map interface displaying antenna locations and relevant data.
   - Users can interact with the map by zooming in/out, panning, and clicking on antenna markers for additional information.

2. Map Features:
   - The map displays different layers representing mobile companies' antenna locations, allowing users to toggle between layers to view specific company data.
   - Users can also search for locations using a search box feature, which highlights the searched location on the map.

3. User Authentication:
   - The application provides basic user authentication functionalities, including login and registration.
   - Users can create an account or log in to access additional features such as submitting ratings and opinions.

4. Rating and Opinion Submission:
   - Authenticated users have the option to submit ratings and opinions regarding mobile reception in their area.
   - Users can provide feedback on their experiences with specific mobile companies' reception quality.

5. Continuous Development:
   - The development team continuously works on improving the application based on user feedback and technological advancements.
   - Updates and new features are rolled out periodically to enhance the application's functionality and usability.

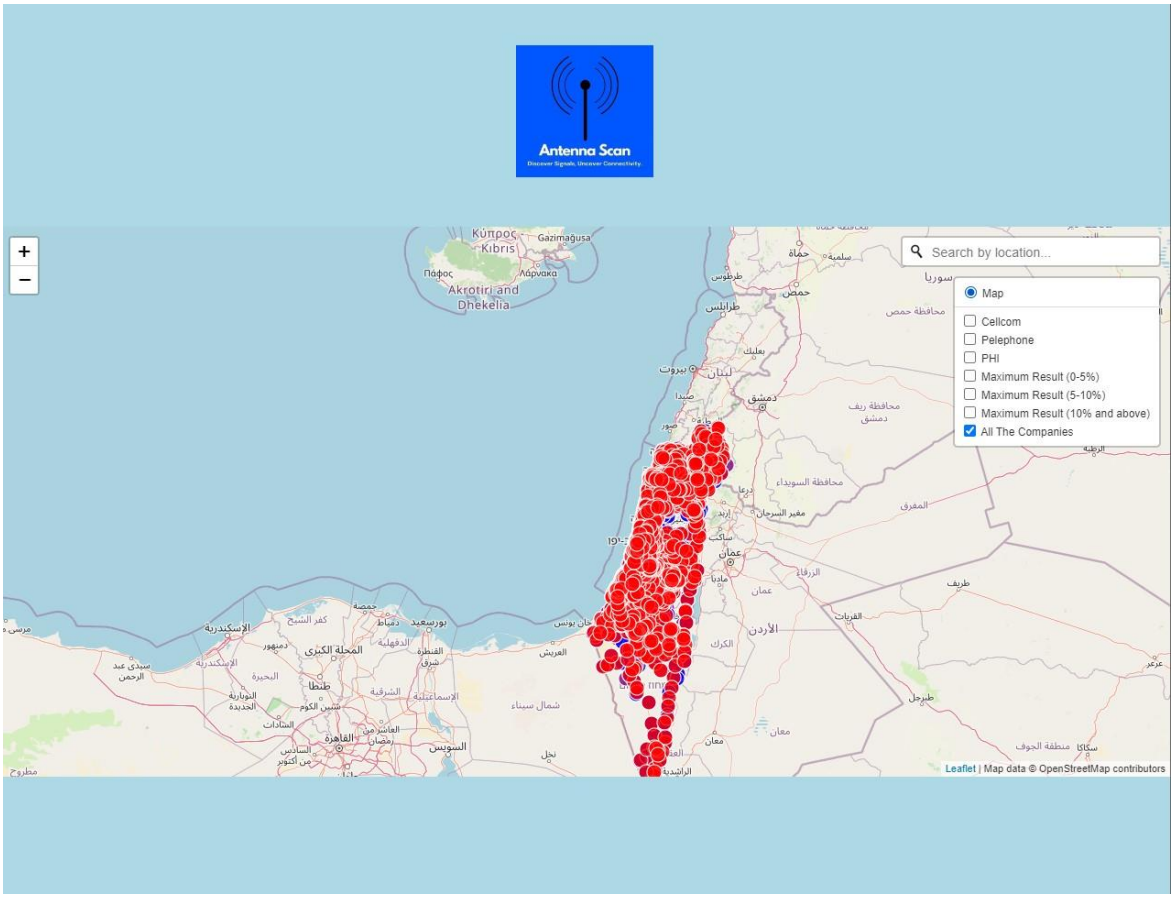
6. Community Engagement:
   - The Antenna Scan application fosters a community of users who share their experiences and insights regarding mobile reception.
   - Users can contribute to the community by sharing information, helping others make informed decisions about mobile carriers, and collectively improving mobile reception experiences.

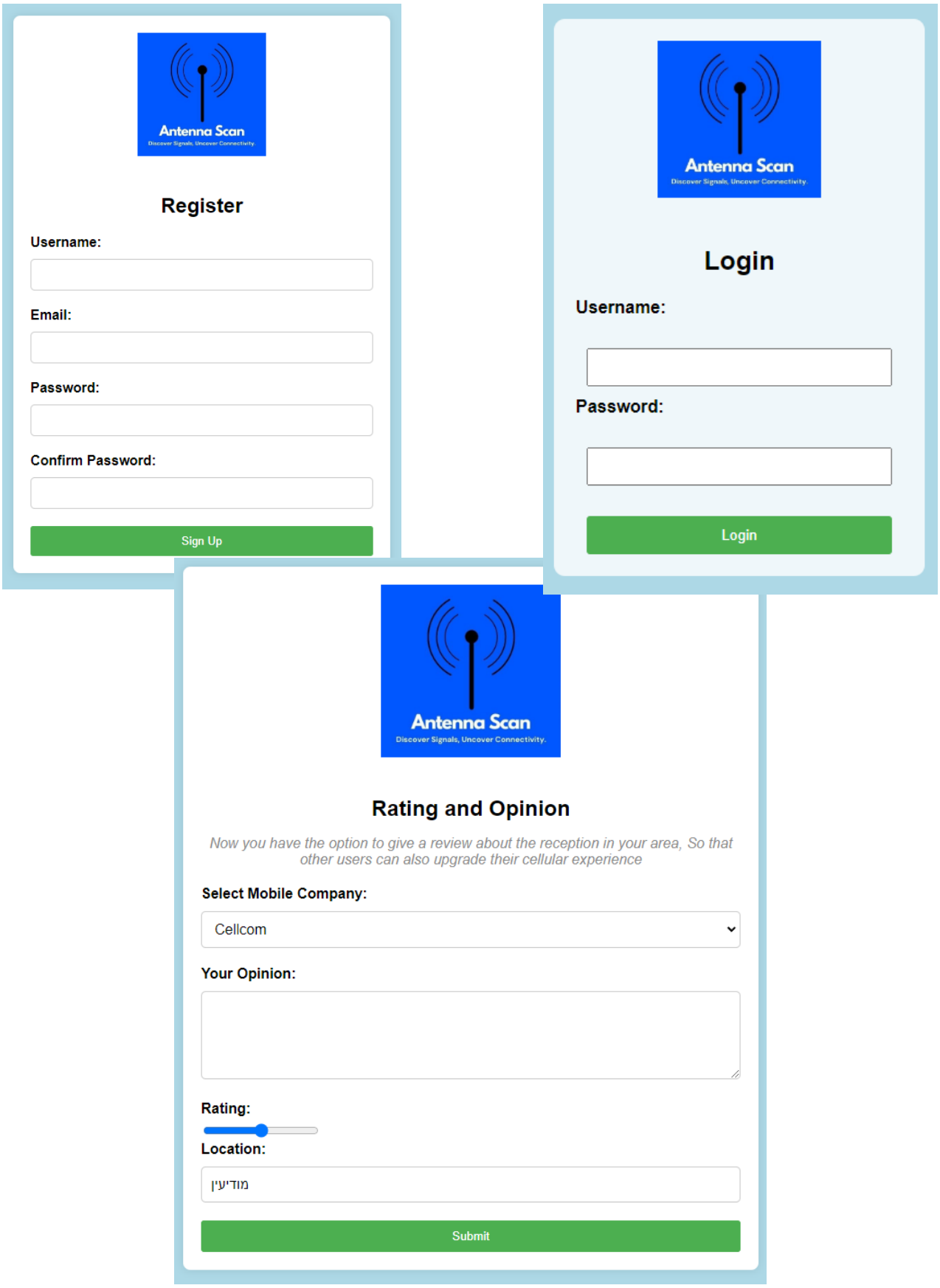
5. Defining functionality for Lean Version:

- Displaying a map with antenna locations and relevant data.
- Allowing users to select and view different layers representing mobile companies.
- Implementing a search box for users to find locations on the map.
- Providing basic user authentication functionalities, such as login and registration.
- Allowing users to submit ratings and opinions about mobile reception in their area.

6. Development of the Lean Version:

- Setting up the basic structure of the application, including HTML, CSS, and JavaScript files.
- Integrating Leaflet.js library to display the map and antenna data.
- Implementing functionality to load and display different layers based on mobile company data.
- Adding a search box feature to allow users to search for locations on the map.
- Creating separate HTML pages for login, registration, and rating/opinion submission.
- Implementing basic server-side functionality to handle user authentication and data submission.
- Testing the application to ensure all essential features work as expected.
- Iteratively refining and improving the application based on user feedback and testing results.




Antenna Scan
Discover Signals, Uncover Connectivity.
Register
Username:
Email:
Password:
Confirm Password:
Sign Up
Antenna Scan
Discover Signals, Uncover Connectivity.
Login
Username:
Password:
Login
Antenna Scan
Discover Signals, Uncover Connectivity.
Rating and Opinion
Now you have the option to give a review about the reception in your area, So that other users can also upgrade their cellular experience
Select Mobile Company:
Cellcom
Your Opinion:
Rating:
Location:
מודיעין
Submit