DumpBuster Project Documentation:

MERN Stack Application with TOMTOM Geocoding and Google API Authentication

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1. Introduction

1.1 Overview

This project is a web application built using the MERN (MongoDB, Express.js, React, Node.js) tech stack. It integrates with the TOMTOM Geocoding API for location-based services and uses React Auth0 for user authentication. The application allows users to report illegal dumping sites by detecting users' location using API while ensuring secure authentication through Google.

How users can report illegal dumping sites?
To report an illegal dumping site through our application, follow these steps:
1) Open the DumpBuster and navigate to the Report Site section.
2) Provide details about the dumping site, including its location (you can use GPS or manually input the address), date, and time.
3) Upload photos or videos of the dumping site to provide visual evidence.
4) Describe the type of waste that has been dumped. Once submitted, your report will be reviewed by our team, and appropriate action will be taken.

Find or organize clean-up events in your area. Volunteer for these events to help remove dumped waste and improve your community's environment. Collaborate with other users and local organizations to make a more significant impact.
Yes, local government agencies can collaborate with DumpBuster to enhance waste management efforts. They can: Access reports from users to identify dumping hotspots. Coordinate cleanup and enforcement efforts more efficiently. Engage with the community to raise awareness and promote responsible waste disposal.
After you report an illegal dumping site: Our team reviews the report to validate its accuracy and completeness. If confirmed, we notify local authorities or environmental agencies for prompt action.

1.2 Purpose

The purpose of this documentation is to provide detailed information about the project's setup, configuration, and usage. It also covers the integration of external APIs for geocoding and authentication.

1.3 Features

- **User registration and authentication using React Auth0.**
- **Report an illegal dumping site**
- Report illegal garbage dumping sites.
- Resolve environmental issues.
- Reclaim a cleaner, greener environment.
- Location-based services include geocoding, mapping, and location-based actions.
- **Integration with TOMTOM Geocoding API for geocoding services.**
- Secure and scalable MERN stack architecture.

2. Getting Started

2.1 Prerequisites

Before you can use this project, make sure you have the following prerequisites installed:
- Node.js and npm (Node Package Manager)
- MongoDB (You can use a cloud-based MongoDB service)
- TOMTOM API Key (for geocoding)
- React Auth0 Key (for authentication)

2.2 Installation

Download the code:
>> Extract it and open it in VS Code

Navigate to the project directory:
>> cd your project

Install server dependencies:
>> npm install

Install client dependencies:
>> set PORT=3002
>>$env:PORT = 3002

>> npm install

2.3 Configuration
- **Set up your MongoDB database** and provide the connection URL in the server configuration (usually in server/config.js).
- **Obtain your TOMTOM API key** and replace the placeholder in the code with your actual API key.
- **Obtain your React Auth0 key** for authentication and replace the placeholder in the code with your actual API key.
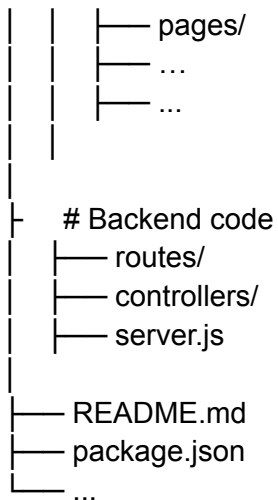
---

3. Project Structure

3.1 Directory Structure

css

DumpBuster/
│
├   # Frontend code
│   ├── src/

```
│  │   ├── pages/
│  │   ├── …
│  │   ├── ...
│  │
│
├─   # Backend code
│  ├── routes/
│  ├── controllers/
│  ├── server.js
│
├── README.md
├── package.json
└── ...
```

3.2 Explanation of Components

- client/: Contains the React-based frontend code.
- server/: Contains the Node. js-based backend code including routes, controllers, and server configuration.
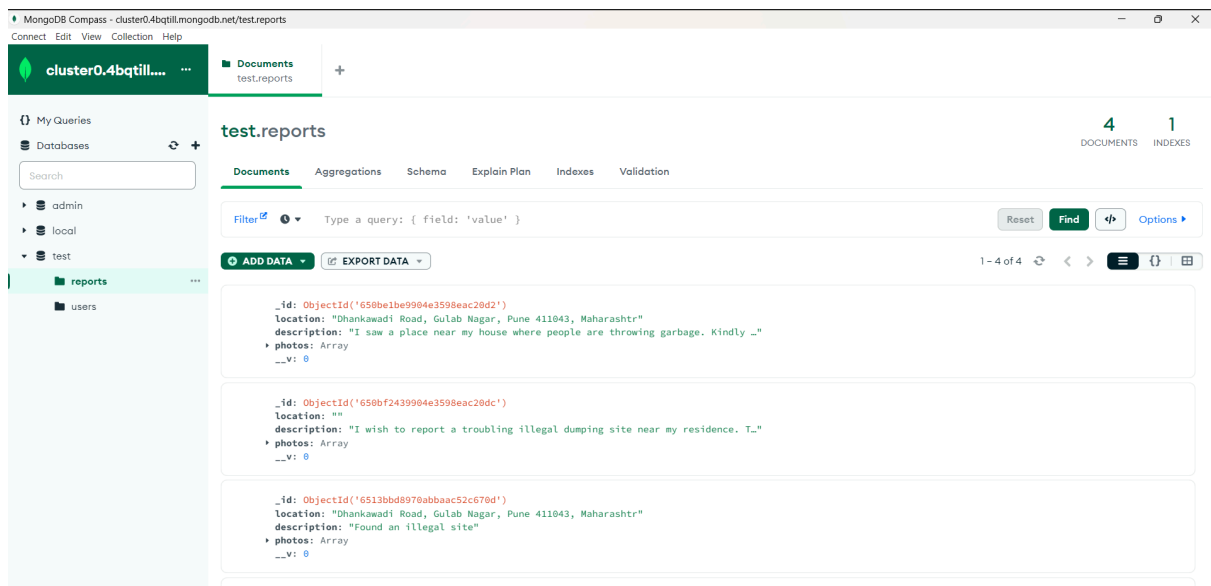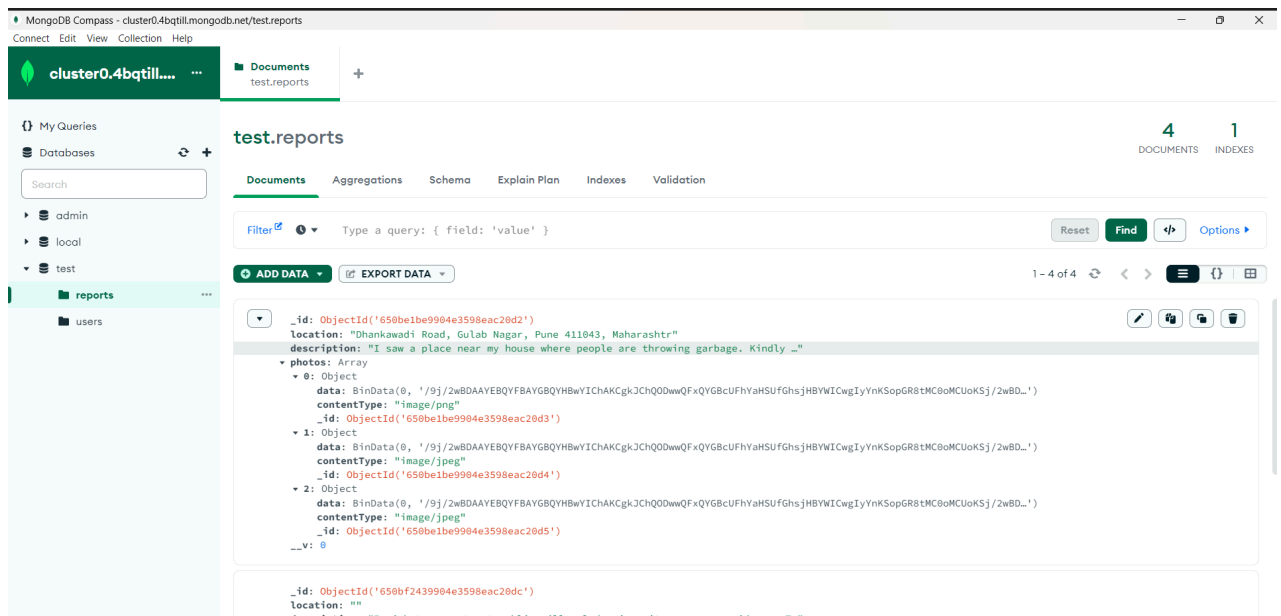
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4. Usage

4.1 Starting the Application

Start the server:
>> node server.js
Start the client:
>> npm start

4.2 Using the Application

- Access the application in your web browser at http://localhost:3002.
- Register or log in using your Google account.
- Explore the location-based features and services provided by the application.

4.3 MongoDB

5. TOMTOM Geocoding API Integration

5.1 Obtaining API Key

To use the TOMTOM Geocoding API, you need to obtain an API key by signing up on the TOMTOM developer portal.
TomTom provides various location-based services, including a Geocoding API that allows developers to convert addresses or place names into geographic coordinates (latitude and longitude). To fetch a user's location using TomTom's Geocoding API, you would typically follow these steps:

Sign Up and Obtain the API Key:
- First, you need to sign up for a TomTom developer account if you don't already have one.

```
const apiKey = 'n0RMtA9kB6L2DvLhegfjM5CPmUbquAjK';
const apiUrl =
`https://api.tomtom.com/search/2/reverseGeocode/${newUserLocation.latit
ude},${newUserLocation.longitude}.json?key=${apiKey}`;
```

5.2 Implementation Details

- Locate the configuration file for TOMTOM API (usually found in server/config.js) and replace the placeholder for the API key with your actual API key.

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6. Google API Authentication

6.1 Obtaining API Key

You need to obtain a Google API key to enable user authentication using Google API. Follow Google's developer documentation to create a project and enable the necessary APIs.

6.2 Implementation Details

- Locate the configuration file for Google API (usually found in client/src/config.js) and replace the placeholder for the API key with your actual API key.

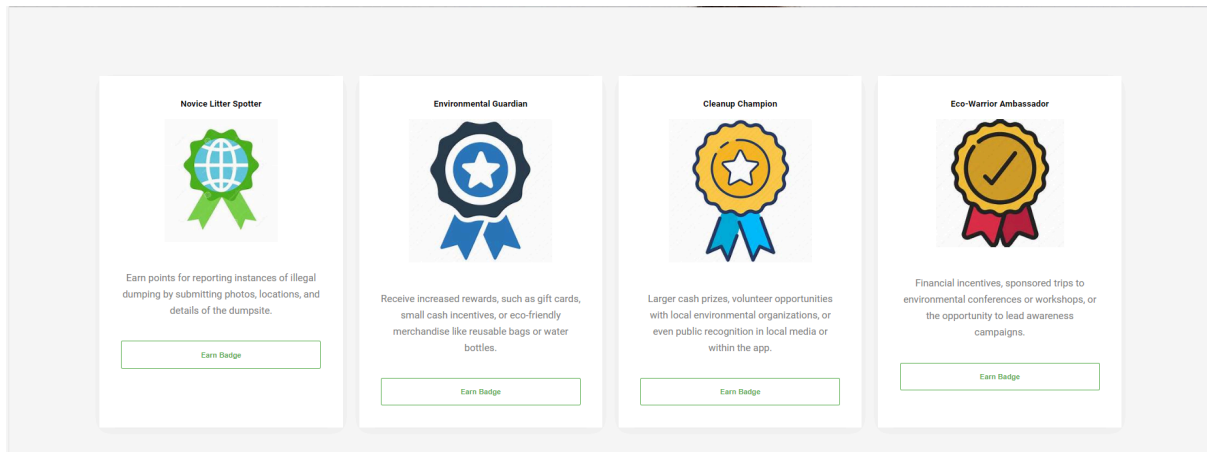# 7. Security

7.1 Best Practices

- Implement proper validation and sanitization of user inputs.

- Use secure authentication and authorization mechanisms.

7.2 Data Protection

- Encrypt sensitive data in the database.
- Implement secure communication between the front end and back end.

Reward system: Exciting part of our application

Say: We will be rewarding 4 badges to users based on their reporting count.

1)Novice Litter Spotter: Earn points for reporting instances of illegal dumping by submitting photos, locations, and details of the dumpsite

2)Environmental Guardian: Receive increased rewards, such as gift cards, small cash incentives, or eco-friendly merchandise like reusable bags or water bottles.

3)Cleanup Champion: Receive increased rewards, such as gift cards, small cash incentives, or eco-friendly merchandise like reusable bags or water bottles.

4)Eco-Warrior Ambassador: Financial incentives, sponsored trips to environmental conferences or workshops, or the opportunity to lead awareness campaigns.

Blogs: Users can read the trending blogs on our site.

In conclusion, the "Dumpbuster" application has the potential to address the critical issue of illegal dumping by leveraging technology and community involvement. It serves as a platform for reporting and coordinating efforts to clean up dumping sites while raising awareness about the environmental impact. The continuous improvement of the application, engagement of users,

and collaboration with relevant authorities can lead to a more effective and impactful solution for combating illegal dumping.

Thank you for using our MERN Stack Application with TOMTOM Geocoding and Google API Authentication. If you have any questions or encounter any issues, please refer to our documentation.

Happy Coding!