Lab 1 Draft: Update Section 1

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Version 2

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1 Introduction

With more than $40 million dollars of taxpayer money being spent to clean up litter in Texas each year (Garza, 2016), it is crucial that this money be used effectively in order to not unnecessarily burden taxpayers. However, this money is not being used efficiently as it takes many volunteers hundreds of hours to be able to locate and clean up litter with more than 625 volunteers being needed to clean up 8,000lbs of litter in 2023 (Fawaz, 2023). While their effort is commendable, one can only wonder how much more waste that volunteers would have been able to collect if they did not have to spend so much time searching for where the waste was dumped.

There are also many environmental problems associated with illegal dumping. Oversized items such as mattresses, tires, and appliances are the most difficult and dangerous items for volunteers to clean up as it requires many volunteers and sometimes even specialized equipment that local governments and volunteers may not have access to without proper planning far in advance to the date of the cleanup. However, when this litter is not seen before the cleanup is organized, it can waste volunteer’s time and taxpayers' money.

Litter also becomes an environmental hazard to tourists and locals when not disposed of effectively. Beaches are a common area where citizens get injures as just under one quarter of beach goers get injured by litter each year (Campbell et al., 2016). These monitary and enviromental problems perfectly avoidable with the right solution. TrashTag aims to be the solution that local governments, volunteers, and non-profit organizations are looking for.

TrashTag is a browser application that helps local governments and volunteers be able to tag and clean up trash by organizing clean up groups. When local governments, non-profits, and

volunteers are all connected in one browser application, they can more easily work together to clean up litter.

2 Product Description

2.1 Key Products and Features

TrashTag is a browser application designed to improve the waste cleanup process by allowing users to photograph and report litter and organize and conduct cleanups. Live reporting will be available for users to get real time litter reports and users will be alerted to nearby litter. Images of litter will be provided to users as well as verification of whether the litter is still there or not. A ranking system will be used to “gamify” the cleanup process. Users will have access to a leaderboard to see where they rank against other users in their area or even worldwide.

TrashTag allows users to take pictures of trash, pin its location on a map, upload it to the website, and organize clean up groups to help dispose of illegally dumped litter. Local governments will spend less money searching for litter when people in the community can tag it for them, and volunteers will have an easier time organizing events when they are all using the same application.

2.2 Major Components (Hardware/Software)

TrashTag uses Python for its backend using Django and its frontend is in JavaScript. Its API will use Digital Ocean as its host.

3 Identification of Case Study

The San Marcos River Foundation was used as our case study. They are a local non-profit that struggles to use their volunteers efficiently since they have to find trash along miles of river. Knowing exactly where these items were dumped would allow them to use their volunteers more efficiently.

4 Glossary

API: Application Programming Interface. A software mechanism for accepting and providing data from and to external applications

Illegal Dumping: The unauthorized disposal of trash and other hazardous materials onto private and/or public property.

Metadata: Descriptive information within data files such as date, location, and timestamp data in photos to be submitted to TrashTag.

Geotagging: The addition of GPS coordinates to images that enable precise location identification where trash was reported.

Live Real-Time Updates: Live data synchronization displaying trash reports to both users and cleanup organizations instantaneously.

Gamification: The incorporation of game-like mechanics such as rankings to motivate user participation and skyrocket cleanup operations.

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