TrashTag

If you can't take it, TAG IT!

Feasibility Presentation

CS 410 Fall 2025 Team Iron

Table of Contents

1

Part 1: The Vision
- Team Bio: Get to Know Us
- Background

2

Part 2: The Societal Problem
- Problem Statement: Reporting Disconnect
- Who is Affected?
- Problem Characteristics
- Current Process Analysis: The Reporting Breakdown

3

Part 3: Our Solution
- Solution Statement: Introducing TrashTag
- Solution: What does it do and What does it not do?
- Solution Flow
- Competition Matrix: Where do we fit in?

4

Part 4: Project Roadmap
- Tools and Technologies: Solution Architecture
- Risk Assessment and Mitigation: Our Strategy for Success
- Appendix: References and Definitions

Team Bio

J. Scott Zumwalt
Team Lead

Sara Perez
Front End Developer &
Document Specialist

Emily Rick
Full Stack
Developer

Teddy Kovacs
Back End Developer &
Database Design

Luca Brooks
Back End Developer &
Test Analyst

Adam Daif
Full Stack Developer
& GIS Specialist

Ryan Fee
Full Stack Developer

Background

- Every year, thousands of pounds of trash is cleaned from public recreation areas by volunteer organizations, individuals, and local municipalities.
- Large items, such as mattresses, tires, and appliances, create challenges for individuals lacking proper equipment to haul and dispose of them properly.
- Bulk dumping and large piles of trash are too much for people to handle, especially if they are only visiting the area for recreational purposes.

Background (cont.)

- While most individuals and cleaning crews do what they can with picking up small amount of litter, they are ill-equipped to handle larger items and excessive amounts of trash.
- This kind of bulk trash has a profound effect on local ecologies by poisoning the water and soil for plant and animal life. This causes approximately 100,000 marine animals to die annually.

Background (cont.)

- Illegal dumping has causes an estimated drop of property values by 7% - 10%.
- Approximately 21% of beach goers report they have been injured from beach litter.
- When people see litter or dumping they are more likely to litter or dump more in that area.

Problem Statement

The communication gap that keeps trash on the map!

Independent organizations and local governments struggle to efficiently locate and resolve the large amount of litter in outdoor recreational areas such as parks, rivers, lakes, and beaches. Over the past 36 years, volunteers in the state of Virginia have removed approximately 7.1 million pounds of litter (Chesapeake Bay Foundation, 2025), yet the problem persists as data pertaining to litter locations remains unknown, causing volunteers to spend more time searching for problem areas instead of cleaning. With limited information on types and volume of litter, volunteers are unprepared when mattresses and tires are encountered, forcing them to leave the waste in place. The accumulation of waste has led to approximately 100,000 marine animal deaths annually (Environmental Volunteers, 2023) and property values declining 7–10% (City of Hampton, n.d.). Communities do not have a live reporting system connecting individuals who encounter litter with organizations that acquire the proper resources to remove it.

Who is Affected?
Focusing on Those Impacted the Most

01

The Environment

The environment is impacted by littering due to landfills, specifically open dumping landfills. Unlike sanitary landfills, open dumping landfills do not provide safeguards to keep toxic chemicals out of the rest of the environment. These landfills also account for at least 40% of all global waste and 10% of all global methane emissions, which is harmful to the environment.[5]

02

Local Governments

Local governments and authorities are affected by littering by having to spend millions of dollars each year in clean-up services.[6] In Virginia, "nearly 3.5 million dollars in taxpayer money" is spent to clean up litter from Virginia's roadways.[7] In other states, even more money is spent cleaning up litter from populated areas ($5 million/year in Arkansas[8] and $40 million/year in Texas[9]).

03

Environmental Organizations

Environmental organizations and volunteers are affected by litter by exposing them to numerous safety risks and giving them a heavy disadvantage when it comes to proper garbage disposal.[10] These factors, along with the annual cost of trash clean up, is enough to negatively impact volunteers and environmental organizations.[11]

04

The General Public

Litter negatively affects the general public by creating various health hazards and environmental hazards. Some of these hazards include disease, waterway issues, lowered aesthetic value, and nature pollution.[12]

Problem Characteristics

Identifying the Critical Gaps

01

Limited Resources:

Independent organizations and local governments often struggle to monitor and track illegal dumping because of limited time, staff, and funding.

02

Inattentiveness:

In recreational and community areas, trash is sometimes left behind unintentionally or because cleanup isn't prioritized, which allows it to build up over time.

03

Lack of Awareness:

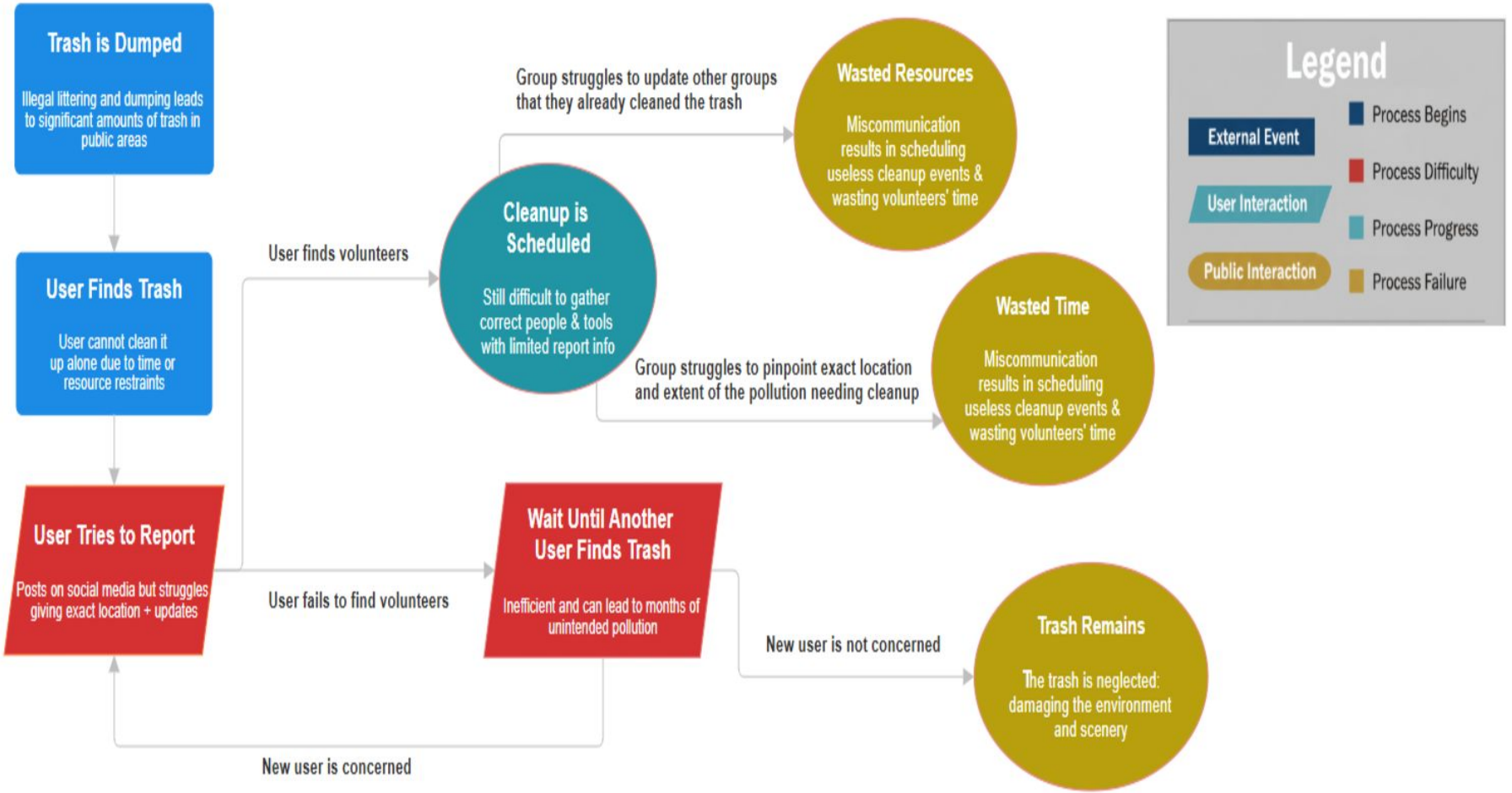
Many people are not fully informed about the environmental and health impacts of littering on local communities and ecosystems.

04

Perceived Small Impact:

Some individuals believe that their own actions don't make a significant difference, which can reduce their motivation to properly dispose of waste.

Current Process Flow



Solution Statement

TrashTag aims to improve the litter and waste cleanup process by developing a mobile application where users can photograph and report piles of waste, give their exact locations, and connect with cleanup groups that are well-equipped to handle the cleanup process in order to improve environmental wellbeing and preserve nature's beauty for the public eye.

We are committed to helping the environment and the public by providing a resource that clearly highlights the location, extent, type and weight of the waste as well as provides updates regarding existing cleanup efforts, dangers and geographic littering patterns to help cleanup crews allocate their time and resources more effectively.

Solution Characteristics

Live Reporting and Mapping:

Users simply snap a picture of the litter and the platform's geotagging feature instantly uploads the location to a live interactive map for cleanup organizations. This will create a more efficient allocation of time, staff, and funding.

"Litter Hero!"

A reward system acknowledging users who successfully clear litter locations from the interactive map platform. This allows users track their progress and notice measurable impact.

Litter Report System

The images provide organizations with a visual understanding of the amount of trash present at the site, allowing them to adequately prepare the appropriate resources to complete cleanups.

Educational Statistics

The app displays data pertaining to the environmental consequences of littering to inform users and raise awareness.

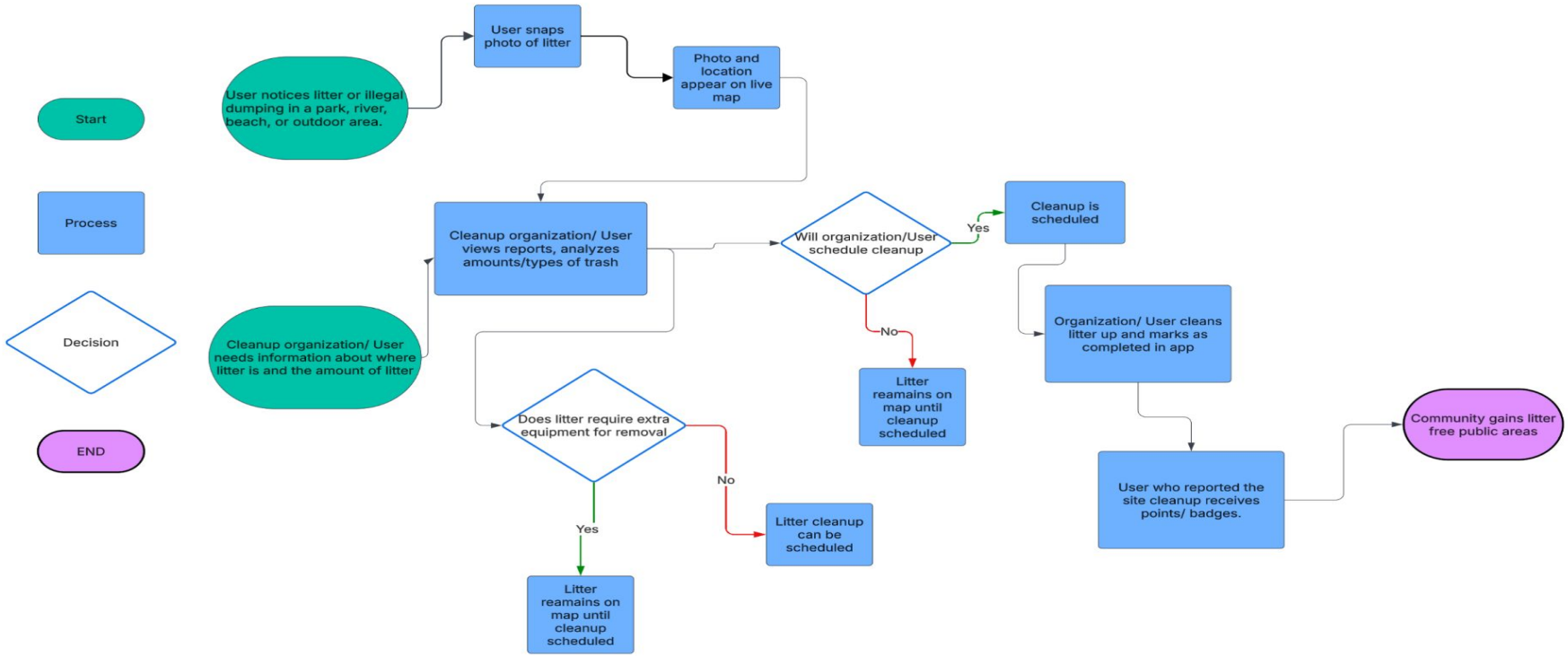
Solution Characteristics: What Will It Do?

- Live Litter Reporting and Mapping
- Ranking System for Active Report and Cleanup Users
- Updates Regarding Cleanup Efforts For Each Report
- Images of Litter for Cleanup Crews to Accurately Gauge Its Extent
- Collaboration Space for Other Users to Provide Information and Updates
- Direct Connection Between Reporters and Cleanup Crews
- Mapping Tools to Scope All Reports in a Geographic Area
- Users Receive Alerts When Near Reported Litter to Verify If It's Gone or Still There

Solution Characteristics: What Will It Not Do?

- Provide Tangible or Monetary Rewards for Active Users
- Guarantee a Cleanup Response
- Law Enforcement and Penalizing Illegal Littering
- Replace Emergency Service Reporting (e.g., chemical waste)

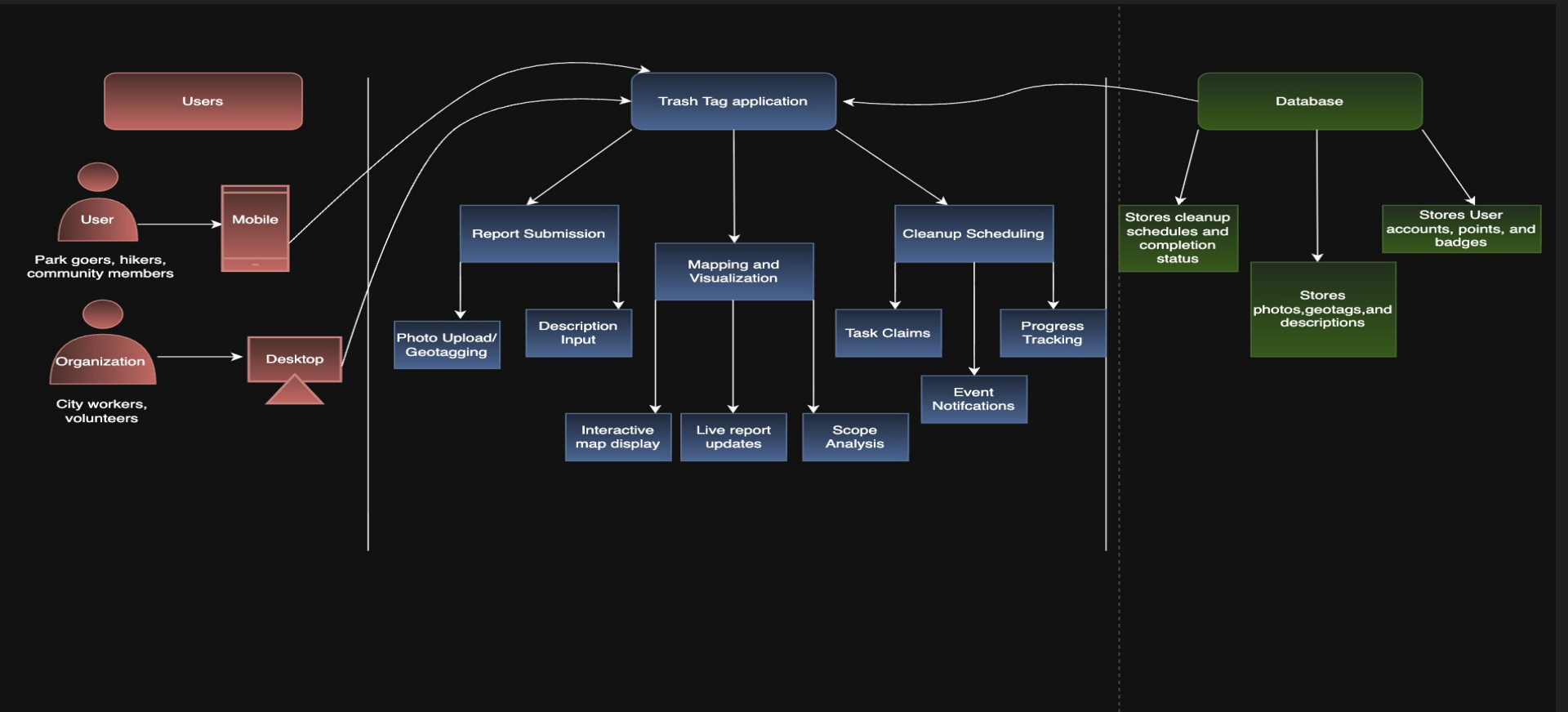
Solution Process Flow



Competition Matrix

Features	TrashTag	Clean Something For Nothing	Pirika	Litterati	City 311 app
Report trash	✔	✔	✔		✔
Upload Geotagged photos of trash	✔	✔	✔	✔	
Interactive map	✔	✔	✔	✔	✔
Size Indicator	✔	✔			
Reward System	✔	✔			
Organize Groups	✔	✔		✔	
Verify Cleanup	✔				
Scheduled Cleanups	✔				

Major Functional Component Diagram



Tools and Technologies

Development Environment - VS Code

Version Control - GitHub

Continuous Integration & Continuous Deployment (CI/CD) - GitHub

Backend Language(s) - TBD

Frontend Language(s) - TBD

Testing Framework(s) - TBD

Documentation Tools - TBD

Risk Assessment & Mitigation

TBD

Appendix

TBD

References

1. “Volunteers Gather Over 16,000 Pounds of Trash from the San Marcos River.” *Corridor News*, 13 Apr. 2020, https://smcorridornews.com/volunteers-gather-over-16000-pounds-of-trash-from-the-san-marcos-river/
2. Fawaz, Maya. “Hundreds of Volunteers will fan out on San Marcos waterways Saturday to clean up trash.” *Kut News*, 3 Mar. 2023, https://www.kut.org/energy-environment/2023-03-03/hundreds-of-volunteers-will-fan-out-on-san-marcos-waterways-saturday-to-clean-up-trash
3. “54th San Marcos River Rendezvous Clean Up.” *Texas Rivers Protection Association*, https://txrivers.org/texas-river-blog/54th-san-marcos-river-rendezvous-clean-up/. Accessed 23 Sept. 2025.
4. Mendoza, Madalyn. “San Marcos River litter 2018.” *My San Antonio*, 31 May 2018, https://www.mysanantonio.com/news/local/slideshow/San-Marcos-River-litter-2018-181939.php
5. Earth Day. “How Our Trash Impacts the Environment.” *EarthDay.org*, updated 22 Sept. 2025, www.earthday.org/how-our-trash-impacts-the-environment/.Accessed 30 Sept. 2025.
6. https://www.texasdisposal.com/blog/the-real-cost-of-littering/ (MLA format this)
7. https://www.vpm.org/news/2022-04-21/on-this-52nd-annual-earth-day-what-is-the-state-of-litter-in-virginia (MLA format this)
8. https://www.thv11.com/article/news/education/arkansas/litter-costs-arkansas-taxpayers-millions/91-38fe040f-82c7-4698-a34a-d8cf7d77de34 (MLA format this)
9. https://ktxs.com/news/abilene/more-than-40-million-taxpayer-dollars-spent-annually-on-texas-litter-cleanup_20160517100457192 (MLA format this)
10. https://www.unep.org/news-and-stories/story/picking-litter-pointless-exercise-or-powerful-tool-battle-beat-plastic#:~:text=In%20March%2C%20it%20was%20payback,the%20scale%20of%20the%20problem. (MLA format this)
11. https://ktb.org/ktb-blog/the-economics-of-litter/#:~:text=Infrastructure%20Impacts,million%20deficit%20in%20infrastructure%20investments. (MLA format this)
12. https://indoortemp.com/resources/how-litter-harms-humans-animals-environment (MLA FORMAT format this)

REFERENCES 1 THROUGH 4 WERE FOR THE ITERATION 1 BACKGROUND. UPDATE THIS SLIDE ACCORDING TO THE NEW BACKGROUND AND OTHER SLIDES.

Add data chart here?

Add a data chart to backup the claims in the background and make the problem statement more “believable” (?)