Introduction

Litter in outdoor recreational areas, such as rivers, parks, lakes, and greenways, remains an environmental and operational concern for communities. Trash discarded by visitors or illegally dumped not only disrupts natural ecosystems but also poses safety hazards, economic burdens, and long-term environmental impairment. According to the U.S. Environmental Protection Agency, aquatic trash harms ecosystems through entanglement, ingestion, and habitat disruption, contributing to the growing global problem of microplastic pollution (EPA, 2023). Municipalities also bear the significant financial burden; U.S. cities collectively spend over $11.5 billion annually on litter cleanup alone (Keep America Beautiful, 2020).

Beyond the environmental and financial impact, the current process of identifying and removing trash is inefficient. Cleanups often depend on volunteers or city workers walking long distances with little guidance, hoping to encounter problem areas. Citizens who find large items (such as tires, furniture, or appliances) often do not know whom to notify or how urgently cleanup teams will be able to respond. This contributes directly to several critical gaps.

Firstly, there is a resource gap: cleanup organizations struggle to quickly and effectively identify illegal dumping sites. Without accurate, current information, teams often deploy labor unnecessarily or show up at a site unprepared for the size of the debris.

Secondly, there is a communication gap: most citizens do not have a proper channel for reporting litter. Reports, whenever made, are very general or late, making organizations unaware of exact locations or severity.

Thirdly, there is a convenience gap: most people notice trash when they are doing something else (walking, hiking, swimming). Once they get home, the opportunity or motivation to report it is gone.

Lastly, there is a perceived impact gap: people often feel their contribution doesn't matter or isn't noticed. When there's no visible feedback about participation in cleanups, participation remains low, despite widespread concern about pollution.

To tackle such societal and environmental challenges, TrashTag proposes a geolocation-based reporting platform where people can quickly upload geotagged photos when they find any trash. It maps those reports in real time to an interactive map, letting organizations identify hotspots, understand the scope of cleanup needed, better plan events, and mobilize the right equipment and volunteers. Such tracking creates gamification through points, streaks, and eventual visible cleanups that will increase engagement and fill current gaps in communication.

TrashTag is a unified data management and communication platform that enables individuals, amplifies the efforts of environmental organizations, and streamlines the cleanup process. By transforming public observation into actionable information, TrashTag represents an organized and scalable solution for a problem otherwise dependent on inconsistent reporting and manual labor.

References

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