AARAMBHA 2024

PROTOBYTES (HACKATHON)

A Project Proposal Report

On

“Safa Sughar: Clean Living, Smart Giving.”

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ABSTRACT

The increasing problem of urban waste mismanagement poses a significant threat to environmental sustainability and public health. This project proposes a **Smart Waste Management System** that integrates geospatial technology, educational resources, and citizen-driven reporting to address these challenges. The system features an interactive map for locating waste bins and pickup points, accessible waste management guidelines to promote proper disposal, and a reporting mechanism that allows users to report illegal dumping by recording and uploading videos. By leveraging technology and community engagement, the proposed system aims to enhance waste collection efficiency, foster environmental awareness, and encourage responsible waste disposal practices, contributing to cleaner and healthier communities.

List of Abbreviations/Acronyms

CO_2	Carbon dioxide
SWM	Solid Waste Management
GHG	GreenHouse Gases
UI	User Interface
UX	User Experience

CHAPTER 1
INTRODUCTION

Waste management is one of the most pressing issues faced by developing countries, and Nepal is no exception. In Kathmandu, the capital city, improper waste disposal has led to severe environmental pollution, health hazards, and a declining quality of life. Known as one of the most polluted cities in the country, Kathmandu struggles with garbage accumulation on streets, inadequate recycling systems, and ineffective waste collection mechanisms. This highlights the urgent need for an efficient and sustainable waste management solution.

The objective of this project is to develop a mobile application that addresses these issues by promoting better waste segregation, ensuring timely waste collection, and encouraging recycling. This application aims to act as a bridge between residents and waste management authorities, making the process more organized and user-friendly.

1.1 Background

Waste management has been a growing concern worldwide, particularly in developing countries where rapid urbanization has outpaced infrastructure development. Cities like Kathmandu, Nepal's capital, are struggling with waste-related challenges due to high population density, limited resources, and a lack of awareness among residents about proper waste disposal practices. Improper waste management not only contributes to environmental degradation but also poses significant health risks to local communities.

Numerous studies have highlighted the adverse effects of poor SWM. According to research by the World Bank, solid waste generation is expected to double in developing countries by 2050, making efficient management systems critical. In Nepal, Kathmandu generates over 1,000 metric tons of waste daily, with a significant portion remaining uncollected or improperly disposed of. This situation has led to pollution of rivers, GHG, increase in C02, streets, and public spaces, impacting both the environment and public health.

A review of waste management practices in other developing nations suggests that technology-driven solutions can play a pivotal role in addressing these challenges. For instance, mobile applications have been used in countries like India and Indonesia to improve waste segregation, streamline collection schedules, and connect citizens with waste management authorities. Such solutions rely on awareness campaigns, reward systems, and real-time data sharing to encourage participation and accountability.

1.2 Statement of the Problem

Kathmandu faces a growing waste management crisis, with over 1,000 metric tons of waste generated daily, much of which remains uncollected or improperly disposed of. The lack of waste segregation, inefficient collection systems, and limited recycling infrastructure contribute to severe environmental pollution and public health risks. Despite efforts by authorities, challenges in coordination and public participation persist. This project aims to address these issues by developing a mobile application to improve waste pickup scheduling, educate users on segregation, and streamline communication between residents and authorities for a more sustainable solution.

1.3 Project objective

General Objective

To develop a mobile application with attractive UI/UX that enhances waste management in Kathmandu by promoting efficient waste collection, proper segregation, and sustainable recycling practices.

Specific Objectives

1. To design and implement features for waste pickup locations
2. To educate users on proper waste segregation
3. To enable residents to report waste-related issues
4. To promote recycling practices by providing a second hand marketplace.

CHAPTER 2

SYSTEM DESIGN AND ARCHITECTURE

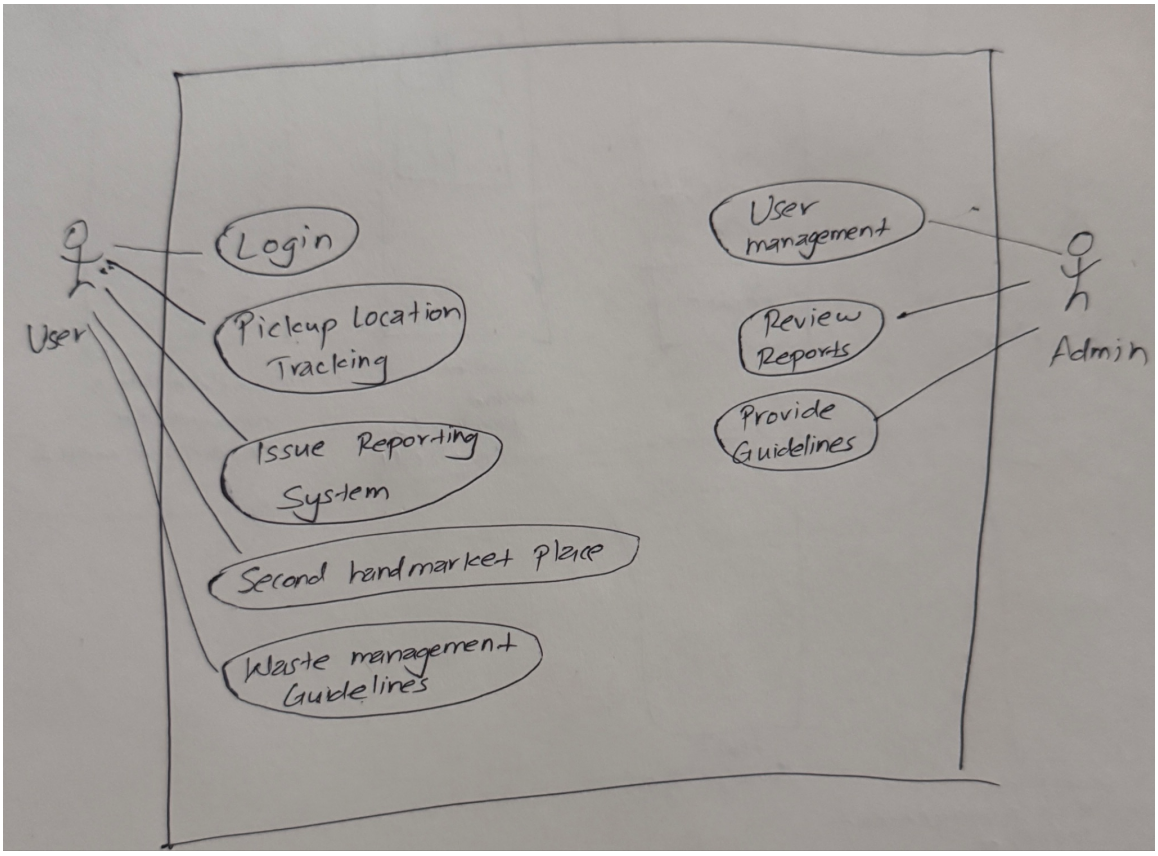

Fig: Use Case Diagram

CHAPTER 3
EXPECTED OUTPUT

Efficient Waste Pickup Location Tracking

- A feature that allows users to track the real-time location of waste disposal areas, ensuring timely waste pickup and improving coordination between residents and authorities.

Issue Reporting System with Video Support

- A user-friendly mechanism for reporting waste-related issues, such as uncollected garbage or illegal dumping, using videos for better documentation and resolution by authorities.

Second-Hand Marketplace for Recycling

- A platform that promotes recycling by enabling users to buy or sell reusable items, fostering a culture of sustainability and reducing waste generation.

Comprehensive Waste Management Guidelines

- An in-app resource providing detailed guidelines on proper waste segregation, disposal methods, and recycling practices, aimed at educating users and encouraging environmentally responsible behavior.

CHAPTER 4
CONCLUSION

In conclusion, waste management remains a critical issue in Kathmandu, with the city's growing population and inadequate infrastructure contributing to severe environmental pollution and health risks. This project aims to tackle these challenges by developing a mobile application that bridges the gap between residents and waste management authorities, promoting efficient waste collection, segregation, and recycling practices.

By integrating features such as waste pickup location tracking, a reporting system for waste-related issues, a second-hand marketplace for recycling, and educational guidelines on waste management, this application has the potential to significantly improve Kathmandu’s waste management system. The adoption of such a technology-driven solution will not only help reduce pollution but also empower residents to take an active role in waste management, ultimately leading to a cleaner, healthier, and more sustainable city.

Through this project, we envision a future where technology plays a pivotal role in tackling environmental challenges, fostering community participation, and creating a model for other cities in Nepal and beyond to follow. The success of this application can serve as a foundation for further innovations and collaborations in the field of sustainable waste management.