

REVIEW 2 ON TOPIC E-WASTE FACILITY LOCATOR

Mrs. Renuka Patil¹, Ms. Snehal Pandit², Ms. Sanika Labade³, Ms. Pranavati Borkar⁴, Ms. Mansi Shinde⁵

Bachelor Of Engineering in Information Technology (Final Year)

Department of Information Technology

Dr. D. Y. Patil College of Engineering, Akurdi Tal. Haveli, Dist. Pune , Pin code – 411044, Maharashtra

ABSTRACT:

The E-Waste Facility Locator is a web-based application designed to help users find authorized e-waste disposal and recycling facilities nearby. By integrating geographic data and user inputs, it allows individuals and organizations to search for facilities based on location, type of e-waste (e.g., mobile phones, batteries, computers), and operational hours. The platform will feature an intuitive interface with filters for specific waste categories and provide real-time navigation. Facility data will be maintained in a database, ensuring up-to-date information on certified locations. Additional features include educational resources, user reviews, and incentives for recycling. This project aims to promote responsible e-waste disposal, contributing to a cleaner and more sustainable environment.

Keywords

E-waste, Recycling, Facility Locator, Geographic data, Sustainable environment

The **E-Waste Facility Locator** project aims to create a web-based solution that enables users to easily find e-waste collection centres based on their geographical location. The platform will integrate real-time mapping, allow users to search for facilities based on the type of electronic waste, and provide essential information about each facility, including operational hours and services offered. By connecting consumers with certified facilities, the project seeks to promote sustainable e-waste disposal and reduce the environmental footprint of electronic waste. In this project, we explore the key technical components required for developing the locator, including geographic information systems (GIS), data integration, and user interface design. The ultimate goal is to offer an accessible tool that helps mitigate the e-waste problem and fosters a more sustainable approach to technology disposal.

I. OBJECTIVE

Design and implement an intuitive interface that allows users to easily search for and locate e-waste recycling facilities based on their current location or a specified area. Utilize GIS technology to accurately map e-waste recycling centers, providing users with precise locations, directions, and distances to the nearest facilities. Gather and display key details about each e-waste facility, including operational hours, types of e-waste accepted, contact information, and any associated fees or services. Include educational content within the tool to inform users about the environmental impacts of e-waste, the importance of recycling, and best practices for e-waste disposal. Implement features that allow users to rate facilities, provide feedback, and share their experiences, thereby improving the quality of the service and fostering a community of responsible e-waste management. Collect and analyze usage data to identify trends, improve the tool's functionality, and better meet the needs of users and the broader e-waste management community.

II. RESEARCH METHODOLOGY

The research methodology for an e-waste facility locator involves several key steps. First, data on e-waste disposal facilities, including their locations and services, is collected from government databases, environmental agencies, and e-waste management companies. Geospatial analysis using GIS tools is then employed to map these facilities and assess their accessibility relative to urban centers and population density. Surveys and interviews with stakeholders, such as consumers and recyclers, provide insights into the challenges and preferences for e-waste disposal. A review of existing literature on e-waste management helps identify gaps and best practices. Finally, optimization models are developed to suggest ideal facility locations, balancing factors like transportation cost and accessibility. This approach ensures a comprehensive, data-driven solution.

1. PROBLEM STATEMENT

The rapid growth in the production and consumption of electronic devices has led to an alarming increase in electronic waste (e-waste). This waste, which includes discarded computers, mobile phones, televisions, and other electronic equipment, contains

hazardous materials that pose significant risks to both the environment and human health if not properly managed. Despite the availability of e-waste recycling facilities, a major challenge remains: many consumers are unaware of where these facilities are located or how to access them.

The current systems for locating e-waste recycling centers are often fragmented, outdated, or difficult to use, resulting in the improper disposal of e-waste, such as dumping in landfills or illegal burning. This improper disposal not only contributes to environmental pollution but also leads to the loss of valuable resources that could be recovered through recycling.

There is a critical need for an efficient, user-friendly solution that helps consumers easily locate and access e-waste recycling facilities. The lack of such a system hinders efforts to manage e-waste effectively and exacerbates the environmental and public health issues associated with it. Therefore, developing an E-Waste Facility Locator is essential to bridging this gap, promoting responsible e-waste disposal, and supporting sustainable environmental practices

2. INTRODUCTION

The rapid advancement of technology has led to the proliferation of electronic devices in our daily lives, ranging from smartphones and laptops to home appliances and medical equipment. However, this surge in electronics usage has resulted in a corresponding increase in electronic waste (e-waste) when these devices become obsolete or reach the end of their lifespan. E-waste contains hazardous substances like lead, mercury, and cadmium, which pose severe risks to both human health and the environment when not disposed of properly. Improper disposal can lead to soil and water contamination, air pollution, and long-term ecological damage.

Despite growing awareness of these issues, many individuals and organizations still face difficulties in locating authorized e-waste disposal and recycling facilities. This gap between consumers and proper disposal channels contributes to the ongoing e-waste management crisis. To address this challenge, there is a pressing need for a user-friendly platform that simplifies the process of finding certified e-waste facilities and encourages responsible disposal practices.

The E-Waste Facility Locator project aims to create a web-based solution that enables users to easily find e-waste collection centres based on their geographical location. The platform will integrate real-time mapping, allow users to search for facilities based on the type of electronic waste, and provide essential information about each facility, including operational hours and services offered. By connecting consumers with certified facilities, the project seeks to promote sustainable e-waste disposal and reduce the environmental footprint of electronic waste.

In this project, we explore the key technical components required for developing the locator, including geographic information systems (GIS), data integration, and user interface design. The ultimate goal is to offer an accessible tool that helps mitigate the e-waste problem and fosters a more sustainable approach to technology disposal.

3. FLOWCHART

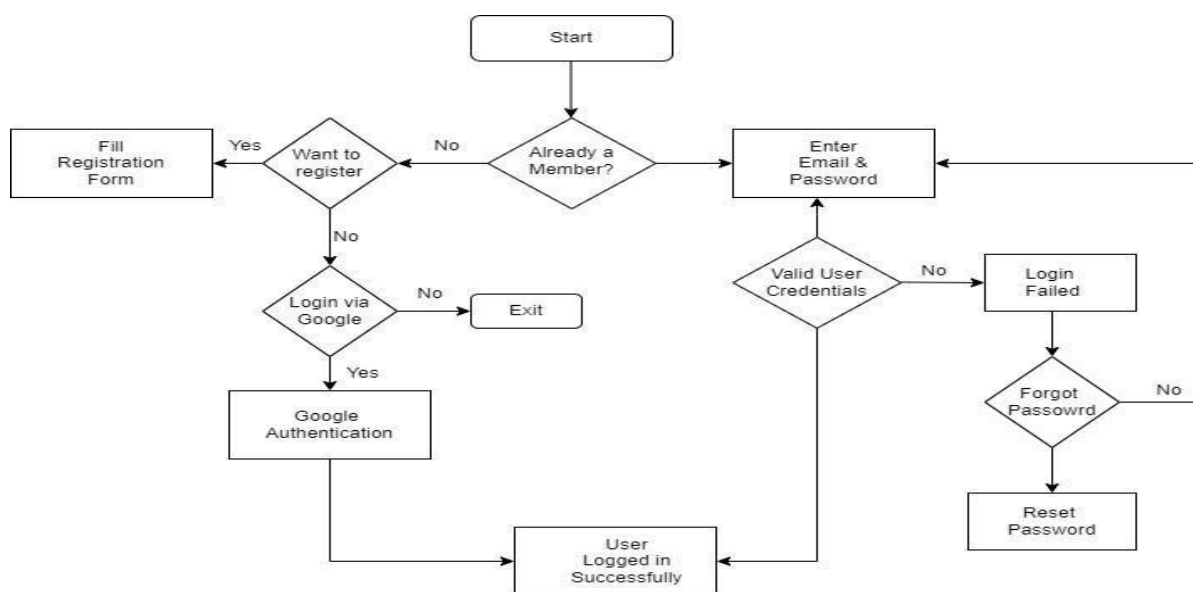


Fig 3.1 User Registration

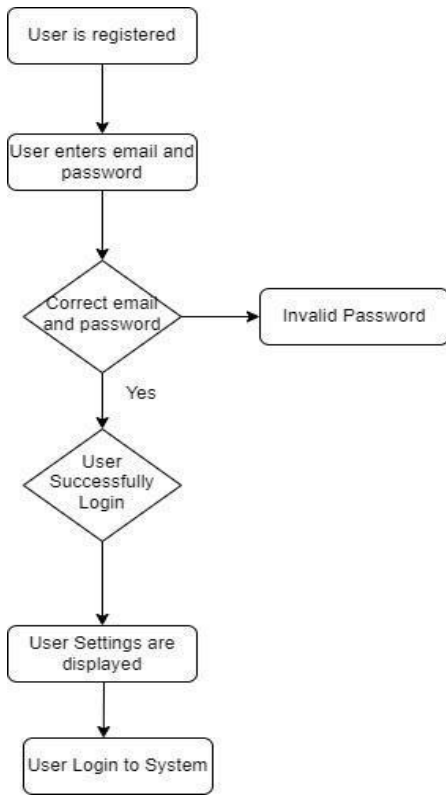


Fig 3.2 User Login

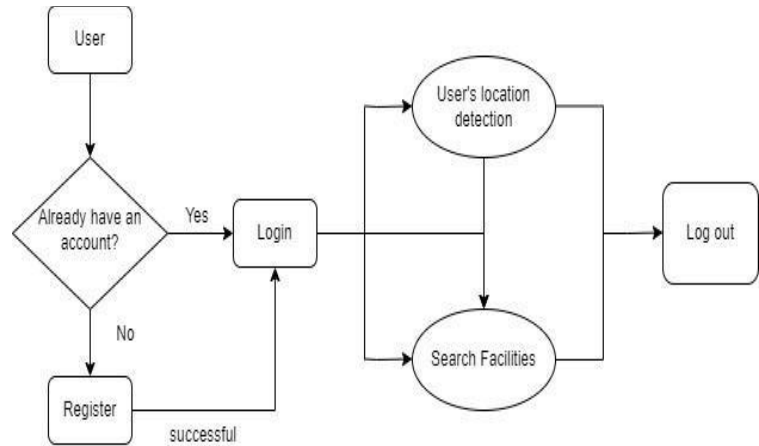


Fig 3.3 Activities after registration

The system architecture diagram represents an e-waste management platform connecting e-waste facility admins, users, and metal scrap recyclers. Admins can add and update e-waste facility locations, manage scrap metal availability, and schedule e-waste pickups. Users interact with the system by locating the nearest e-waste facility via Google Maps API, inputting device information to learn about electronic components, and receiving assistance through an AI-powered chatbot. Additionally, users can access information about the importance of e-waste facilities, analyze e-waste components, and earn rewards for proper disposal. Recyclers can register and coordinate with admins regarding scrap metal availability and scheduled pickups. The system is powered by a centralized server and database that manages all interactions.

The details of these identified objects are then sent to an Object Analysis Model that accesses image data and displays a list of components associated with the identified objects. This information is further refined by a Component Analysis Model to classify the components. The classified components list is then provided to the Admin, who can confirm details and manage the system. Finally, the Database stores all data and helps display the nearest e-waste facility location to the user based on the processed information.

4. CONCLUSION

The E-Waste Facility Locator project addresses a critical need in the global effort to manage electronic waste responsibly. With the increasing proliferation of electronic devices, the volume of e-waste is growing at an alarming rate, posing significant environmental and health risks if not properly managed. Despite the availability of recycling facilities, many individuals and businesses struggle to locate these centers, leading to improper disposal of e-waste.

This project aims to bridge this gap by developing a user-friendly tool that allows consumers to easily find and access the nearest e-waste recycling facilities. By integrating advanced technologies such as GIS, a comprehensive database, and a responsive design, the E-Waste Facility Locator ensures that users can quickly and accurately locate recycling centers, obtain detailed information about their services, and receive educational resources on responsible e waste disposal.

The successful implementation of this project will contribute to reducing the environmental impact of e-waste, promoting the recycling of valuable materials, and fostering a culture of sustainability. As the tool evolves and expands its geographic coverage,

it has the potential to make a significant impact on global e-waste management practices, helping to protect the environment and public health for future generations. The E-Waste Facility Locator is more than just a tool; it is a step toward a more sustainable future, where electronic waste is managed efficiently and responsibly, and where individuals are empowered to take action in protecting the environment.

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