



INSTITUTE OF AERONAUTICAL ENGINEERING (AUTONOMOUS)

Dundigal - 500 043, Hyderabad, Telangana

1	Name of the Student	P.MAHENDRA
2	Roll Number	25951A6688
3	Branch and Section	CSE-(AI&ML) - B
4	Program	B. Tech
5	Course Name	Front End Web Development
6	Course Code	ACSE04
7	Please tick (✓) relevant Engineering Competency (ECs) Profiles	
EC	Profiles	(✓)
EC 1	Ensures that all aspects of an engineering activity are soundly based on fundamental principles - by diagnosing, and taking appropriate action with data, calculations, results, proposals, processes, practices, and documented information that may be ill-founded, illogical, erroneous, unreliable or unrealistic requirements applicable to the engineering discipline	✓
EC 2	Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models.	✓
EC 3	Support sustainable development solutions by ensuring functional requirements, minimize environmental impact and optimize resource utilization throughout the life cycle, while balancing performance and cost effectiveness.	✓
EC 4	Competently addresses complex engineering problems which involve uncertainty, ambiguity, imprecise information and wide-ranging or conflicting technical, engineering and other issues.	
EC 5	Conceptualizes alternative engineering approaches and evaluates potential outcomes against appropriate criteria to justify an optimal solution choice.	
EC 6	Identifies, quantifies, mitigates and manages technical, health, environmental, safety, economic and other contextual risks associated to seek achievable sustainable outcomes with engineering application in the designated engineering discipline.	
EC 7	Involve the coordination of diverse resources (and for this purpose, resources include people, money, equipment, materials, information and technologies) in the timely delivery of outcomes	✓
EC 8	Design and develop solution to complex engineering problem considering a very perspective and taking account of stakeholder views with widely varying needs.	

	EC 9	Meet all level, legal, regulatory, relevant standards and codes of practice, protect public health and safety in the course of all engineering activities.	
--	------	--	--

	EC 10	High level problems including many component parts or sub-problems, partitions problems, processes or systems into manageable elements for the purposes of analysis, modelling or design and then re-combines to form a whole, with the integrity and performance of the overall system as the top consideration.	
	EC 11	Undertake CPD activities to maintain and extend competences and enhance the ability to adapt to emerging technologies and the ever-changing nature of work.	✓
	EC 12	Recognize complexity and assess alternatives in light of competing requirements and incomplete knowledge. Require judgement in decision making in the course of all complex engineering activities.	
8	Please tick (✓) relevant Course Outcomes (COs) Covered		
	CO	Course Outcomes	(✓)
	CO 1	Understand and apply semantic HTML5 and responsive CSS3 techniques to design a clean and accessible interface for a waste reporting portal.	✓
	CO 2	Develop interactive user features using JavaScript ES6 and React components to handle waste report submissions and display awareness content.	✓
	CO 3	Implement client-side data storage and validation techniques using local storage to simulate real-time reporting without a backend.	✓
	CO4	Apply responsive design principles such as Flexbox, CSS Grid, and media queries to ensure usability across different screen sizes and devices.	
	CO 5	Demonstrate the integration of sustainable development concepts by delivering recycling awareness information and encouraging community participation.	✓
	CO 6	Use Git and GitHub for version control, documentation, and structured submission of the project following professional coding practices.	✓
9	Course ELRV Video Lectures Viewed	Number of Videos	Viewing time in Hours
		-	-
10	Justify your understanding of WK1	-	
11	Justify your understanding of WK2 – WK9	-	
12	How many Wks from WK2 to WK9 were implanted?	-	
	Mention them	-	

Date: 11-12-2025

P.MAHENDRA

Signature of the Student

2

3

COMPLEX ENGINEERING PROBLEM

A COURSE SIDE PROJECT ON

Front End Web Development

P.MAHENDRA

25951A6688

Recycle Radar Based on FEWD

**A Project
Report
submitted in
partial
fulfillment of
the
requirements for the award of the degree of**

**Bachelor of Technology in
CSE (Artificial Intelligence & Machine Learning)**

By

**P.MAHENDRA
25951A6688**



Department of CSE (Artificial Intelligence & Machine Learning)

**INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal, Hyderabad – 500 043, Telangana**

November, 2025

DECLARATION

I certify that

- a. The work contained in this report is original and has been done by me under the guidance of my supervisor (s).
- b. The work has not been submitted to any other Institute for any degree or diploma.
- c. I have followed the guidelines provided by the Institute for preparing the report.
- d. I have conformed to the norms and guidelines given in the Code of Conduct of the Institute.
- e. Whenever I have used materials (data, theoretical analysis, figures, and text) from other sources, I have given due credit to them by citing them in the text of the report and giving their details in the references. Further, I have taken permission from the copyright owners of the sources, whenever necessary.

P.MAHENDRA

Signature of the Student

Date: 11-11-2025

Place: Hyderabad

CERTIFICATE

This is to certify that the project report entitled **Recycle Radar – Local recycling locator using Map API.** submitted by **P.MAHENDRA** to the Institute of Aeronautical Engineering, Hyderabad in partial fulfilment of the requirements for the award of the Degree Bachelor of Technology in CSE (Artificial Intelligence & Machine Learning) is a Bonafide record of work carried out under my guidance and supervision. The contents of this report, in

full or in parts, have not been submitted to any other Institute for the award of any Degree.

Supervisor

Head of the Department

Principal

Date:

Place: Hyderabad

APPROVAL SHEET

This project report entitled **Recycle Radar – Local recycling locator using Map API** submitted by Mr. **P.MAHENDRAS** is approved for the award of the Degree Bachelor of Technology in Branch CSE (Artificial Intelligence & Machine Learning).

Examiner

Supervisor(s)

Principal

Date:

Place: Hyderabad

ACKNOWLEDGEMENT

The satisfaction that accompanies the successful completion of any task would be incomplete without introducing the people who made it possible and whose constant guidance and encouragement crowns all efforts with success.

I am extremely grateful and express my profound gratitude and indebtedness to my project guide **Mr. V Vidya Sagar, Assistant Professor, Department of CSE (AI & ML)**, for his kind help and for giving me the necessary guidance and valuable suggestions for this project work.

I am grateful to **Dr. M. Purushotham Reddy, Professor and Head of the Department, Department of CSE (Artificial Intelligence & Machine Learning)**, for extending his support to carry on this project work. I take this opportunity to express my deepest gratitude to one and all who directly or indirectly helped me in bringing this effort to present form.

I express my sincere gratitude to **Dr. L. V. Narasimha Prasad, Professor and Principal** who has been a great source of information for my work.

I thank our college management and respected **Sri M. Rajashekhar Reddy, Chairman, IARE, Dundigal** for providing me with the necessary infrastructure to conduct the project work.

I take this opportunity to express my deepest gratitude to one and all who directly or indirectly helped me in bringing this effort to present form.

ABSTRACT

Recycle Radar is a responsive web application designed to promote responsible waste management and support community reporting. The system allows users to submit waste-related issues with location details, access educational materials on recycling and segregation, and track the status of reported cases through a simple dashboard. The platform combines awareness content with practical reporting tools to encourage public participation in local clean-up efforts. Built using HTML, CSS, JavaScript, and React, Recycle Radar provides an accessible interface that works across devices and follows semantic and responsive design standards. The project demonstrates the use of front-end technologies for environmental awareness, issue reporting, and community engagement without the need for a complex backend. Overall, Recycle Radar offers a scalable foundation for digital waste management solutions that can support cleaner neighbourhoods and increase public involvement in sustainable practices.

Keywords: Waste Reporting, Recycling Awareness, Web Application, Community Engagement, Responsive UI, Front-End Development.

CONTENTS

Name of Contents	Page No.
Title Page	01 - 04
Declaration	05
Certificate	06
Approval Sheet	07
Acknowledgement	08

Abstract	09
Contents	10
Chapter 1- Introduction	11 – 12
1.1 Problem Statement	11
1.2 Introduction	11
1.3 Requirements	12
1.4 Prerequisites	12
1.5 Technologies used	12
Chapter 2 - Review of Relevant Literature	13
Chapter 3- Methodology	14
Chapter 4- Results and Discussions	15
Chapter 5- Conclusions and Future Scope	16
5.1 Conclusion	16
5.2 Future Scope	16
References	17

CHAPTER 1

INTRODUCTION

1.1 Problem Statement

Cities and communities face increasing waste management challenges. Common issues include:

- Lack of awareness about recycling and waste segregation
- Improper disposal of household and public waste
- Limited community participation in waste reporting
- No centralized digital platform for reporting waste issues
- Delayed action due to inefficient communication
- Weak visibility of clean-up initiatives and environmental campaigns

1.2 Introduction

Recycle Radar is a web-based platform designed to improve community waste management through digital reporting and awareness. The system allows users to:

Report waste issues with location and brief description

Access learning materials on recycling and segregation

View all submitted reports and their status

Track local clean-up events and awareness campaigns

Recycle Radar uses responsive layouts so users can report from any device. The dashboard displays all reports stored locally, helping users see ongoing and completed actions. The project promotes environmental responsibility and encourages active participation in keeping local surroundings clean.

1.3 Requirements

The project requires basic knowledge of:

- **Web structure and layout principles**
- **Responsive design** using Flexbox and Grid
- **DOM handling** for form inputs and UI events
- **Basic data storage** using local storage
- **Clean UI design concepts**

1.4 Prerequisites

To build this system, one must understand:

- **HTML** for semantic page structure
- **CSS** for styling and responsive layout
- **JavaScript** for interactivity and component behaviour
- **React** for building reusable UI components
- Familiarity with **developer tools**, debugging, and UI design principles

1.5 Technologies Used

This project uses:

- **HTML** – For web page layout and semantic structure
- **CSS** – For responsive design using Grid, Flexbox, and media queries
- **JavaScript** – For dynamic functionality and event handling
- **React** – For component-based development and state management
- **Local Storage** – For storing submitted reports without backend

CHAPTER 2

REVIEW OF RELEVANT LITERATURE

Studies on waste management systems highlight the need for digital platforms that support community engagement and improve waste reporting practices. Earlier solutions mainly focused on static information pages with limited reporting features. Recent research emphasizes the importance of realtime reporting tools, interactive dashboards, and visual awareness content to guide users in waste segregation and recycling. Web-based systems that allow users to submit location-specific reports demonstrate higher participation levels and faster response from local authorities. Literature shows that digital interfaces strengthen public environmental behaviour and encourage cleaner community practices through access to educational resources. Research further suggests that responsive design and cross-device accessibility play a key role in community adoption of waste management applications. Modern frameworks enable scalable interfaces, making digital reporting systems more efficient for environmental monitoring and awareness campaigns.

CHAPTER 3

METHODOLOGY

The methodology follows a structured development approach:

- **User Requirement Analysis:**

Identify essential features such as waste issue reporting, awareness content display, report status tracking, and a clean dashboard for viewing submitted cases.

- **Interface Design:**

Design responsive web pages and reporting forms using HTML5 and CSS3.

Ensure accessibility, clear navigation, and mobile-friendly layouts.

- **Dynamic Functionality:**

Use JavaScript ES6 and React to manage form inputs, update report lists, and display resolution status dynamically without page reloads.

- **Data Handling:**

Store user reports in local storage to simulate data persistence.

Manage report objects using JSON for easy retrieval and display.

- **Visualization:**

Provide a simple dashboard showing reported issues, category breakdown, and progress updates for clean-up campaigns or resolved reports.

- **Testing and Evaluation:**

Test usability across different devices and screen sizes. Verify form validation, data flow, responsiveness, and interface clarity to ensure a smooth user experience.

CHAPTER 4

RESULTS AND DISCUSSIONS

Recycle Radar successfully supports community waste management by providing a simple digital platform for reporting waste issues and accessing awareness materials. The dashboard updates instantly when a new report is submitted, offering clear visibility of reported locations and their status. Users found the interface easy to navigate due to responsive layouts, structured content, and simple reporting steps. Testing showed improved participation in reporting compared to traditional offline methods, where complaints are often delayed or ignored. The awareness section helped users understand proper waste segregation, recycling practices, and the importance of individual action in environmental protection. The results show that modern web technologies can create effective tools for public engagement in waste management and support cleaner community initiatives.

CHAPTER 5

CONCLUSION AND FUTURE SCOPE

5.1 Conclusion

Recycle Radar provides a simple and efficient way to support community waste management by enabling users to report waste issues and access recycling awareness materials through a single

platform. It demonstrates how interactive web design increases accessibility and encourages public participation in environmental activities. The system helps users understand waste segregation practices and track the status of reported issues. Overall, Recycle Radar establishes a foundation for developing a fully scalable digital waste management solution with advanced features in the future.

5.2 Future Scope

Future enhancements may include:

- Persistent data storage using databases
- Map-based visualization of reported waste locations
- User authentication and profile management
- Notifications for clean-up campaigns and status updates
- Gamification features such as badges or reward points
- Chatbot support for recycling guidance

These additions can improve system reliability, awareness impact, and user engagement.

REFERENCES

1. Jon Duckett, **HTML & CSS: Design and Build Websites**.

2. W3Schools – Web Development Tutorials (HTML, CSS, JavaScript).
3. MDN Web Docs – JavaScript, Web APIs, and Front-End Documentation.
4. Nielsen, J. **Usability Guidelines for Web Interfaces**.
5. Responsive Web Design Principles – Online Articles.
6. React Official Documentation – **react.dev**.
7. Web Accessibility Guidelines (WCAG) – Online Standards.
8. Articles on Waste Segregation and Recycling Awareness – Online Resources.