

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
“Jnana Sangama”, Belgaum -590014, Karnataka.



Full Stack Web Development Report
On

“ECOSHARE”

Submitted by

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Under the Guidance of

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in partial fulfilment for the award of the degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING



B.M.S. COLLEGE OF ENGINEERING
(Autonomous Institution under VTU)

BENGALURU-560019 Sep 2025 – Jan 2026
B. M. S. College of Engineering, Bull Temple Road, Bangalore 560019
(Affiliated to Visvesvaraya Technological University, Belgaum)
Department of Computer Science and Engineering



CERTIFICATE

This is to certify that the project work entitled **“ECOSHARE”** carried out by **NIKHITHA S (IBM24CS189), NIKITHA M N (IBM24CS190), PANCHAMI P (IBM24CS196), HARSH BAFNA(IBM24CS357)** who are bonafide students of **B. M. S. College of Engineering**. It is in partial fulfillment for the award of **Bachelor of Engineering in Computer Science and Engineering** of the Visveswaraiah Technological University, Belgaum during the year 2025-2026. The project report has been approved as it satisfies the academic requirements in respect of **Full Stack Web Development(23CS3AEFWD)** work prescribed for the said degree.

Signature of the Guide
MOHAN M

Assistant Professor
BMSCE, Bengaluru

Signature of the HOD
Dr. Kavitha Sooda

Prof & Head of Dept of CSE
BMSCE, Bengaluru

External Viva

Name of the Examiner

Signature with date

1)

2)

**B.M.S. COLLEGE OF ENGINEERING DEPARTMENT OF COMPUTER
SCIENCE AND ENGINEERING**



DECLARATION

We, **NIKHITHA S (1BM24CS189), NIKITHA M N (1BM24CS190), PANCHAMI P (1BM24CS196), HARSH BAFNA(1BM24CS357)** students of 3rd Semester, B.E, Department of Computer Science and Engineering, BMS College of Engineering, Bangalore, hereby declare that, this Full Stack Web Development entitled "**ECOSHARE**" has been carried out by us under the guidance of **Mohan M, Assistant Professor**, Department of CSE, BMS College of Engineering, Bangalore during the academic semester Sep 2025 - Dec 2026. We also declare that to the best of our knowledge and belief, the development reported here is not from part of any other report by any other students.

Signature

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INTRODUCTION

1.1 Overview

EcoShare is a web-based application developed using the MERN stack (MongoDB, Express, React, and Node.js) that aims to simplify group travel planning while promoting environmentally responsible decisions. The platform allows users to create trips, add members, record shared expenses, and automatically calculate settlements so that everyone knows who owes whom.

What makes EcoShare unique is the integration of eco-intelligence into financial decision-making. Each expense is assigned an environmental impact score, and users are encouraged to choose eco-friendly alternatives. Based on these choices, users earn GreenPoints, which reflect their contribution to sustainable travel. The application also provides dashboards, leaderboards, and activity history to give users complete visibility into both their spending and their environmental impact.

By combining expense management with sustainability awareness, EcoShare serves as a collaborative, transparent, and socially responsible travel management platform.

1.2 Motivation

The motivation behind developing EcoShare comes from two major real-world problems faced by travellers:

1. Difficulty in managing shared expenses
During group trips, people often forget who paid, how much was spent, and who owes whom. This leads to confusion, disputes, and inaccurate settlements.
2. Lack of awareness about environmental impact
Most travel and expense-tracking applications focus only on money. They do not consider the environmental cost of transportation, accommodation, or food choices. As a result, users are not encouraged to make eco-friendly decisions.

EcoShare was created to bridge this gap by combining financial transparency with environmental responsibility. By rewarding eco-friendly choices with GreenPoints and showing CO₂ savings, the platform motivates users to travel more sustainably while still keeping their expenses organized and fair.

SOFTWARE REQUIREMENTS

2.1 Hardware Requirements

- Processor: Intel Core i3 or above
- RAM: Minimum 4 GB (8 GB recommended)
- Storage: Minimum 10 GB free disk space
- System Type: 64-bit system
- Input Devices: Keyboard and Mouse
- Output Devices: Monitor
- Internet Connection: Required for development, testing, and API usage

2.2 Software Requirements

Operating System

- Windows 10 / 11
- Linux (Ubuntu 20.04 or later)
- macOS (Monterey or later)

Frontend Technologies

- React (Vite)
- Tailwind CSS
- HTML5
- CSS3
- JavaScript (ES6+)

Backend Technologies

- Node.js
- Express.js

Database

- MongoDB (Local or MongoDB Atlas)

Authentication

- JSON Web Tokens (JWT)

Development Tools

- Visual Studio Code
- Git & GitHub

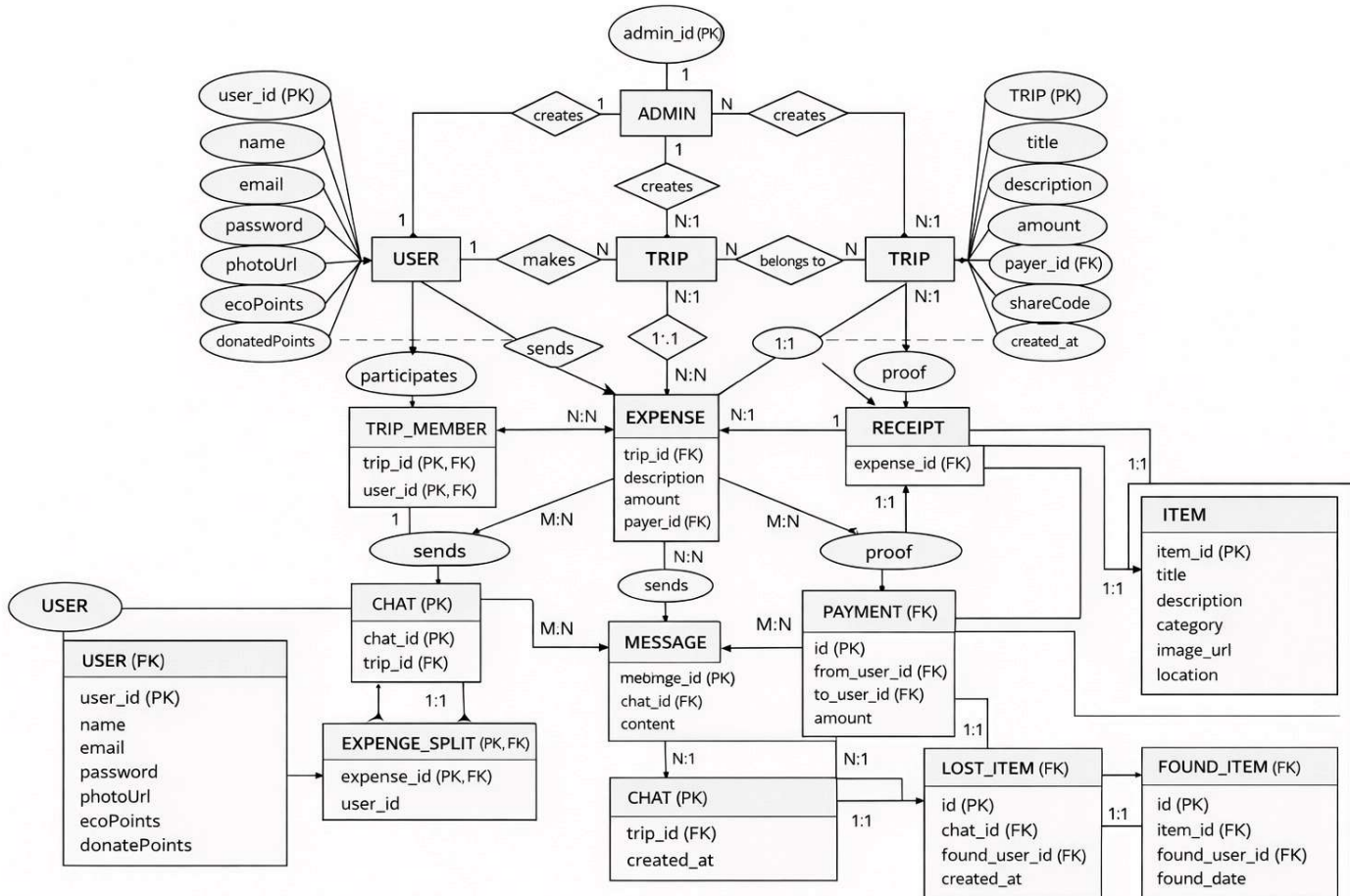
Web Browser

- Google Chrome
- Mozilla Firefox

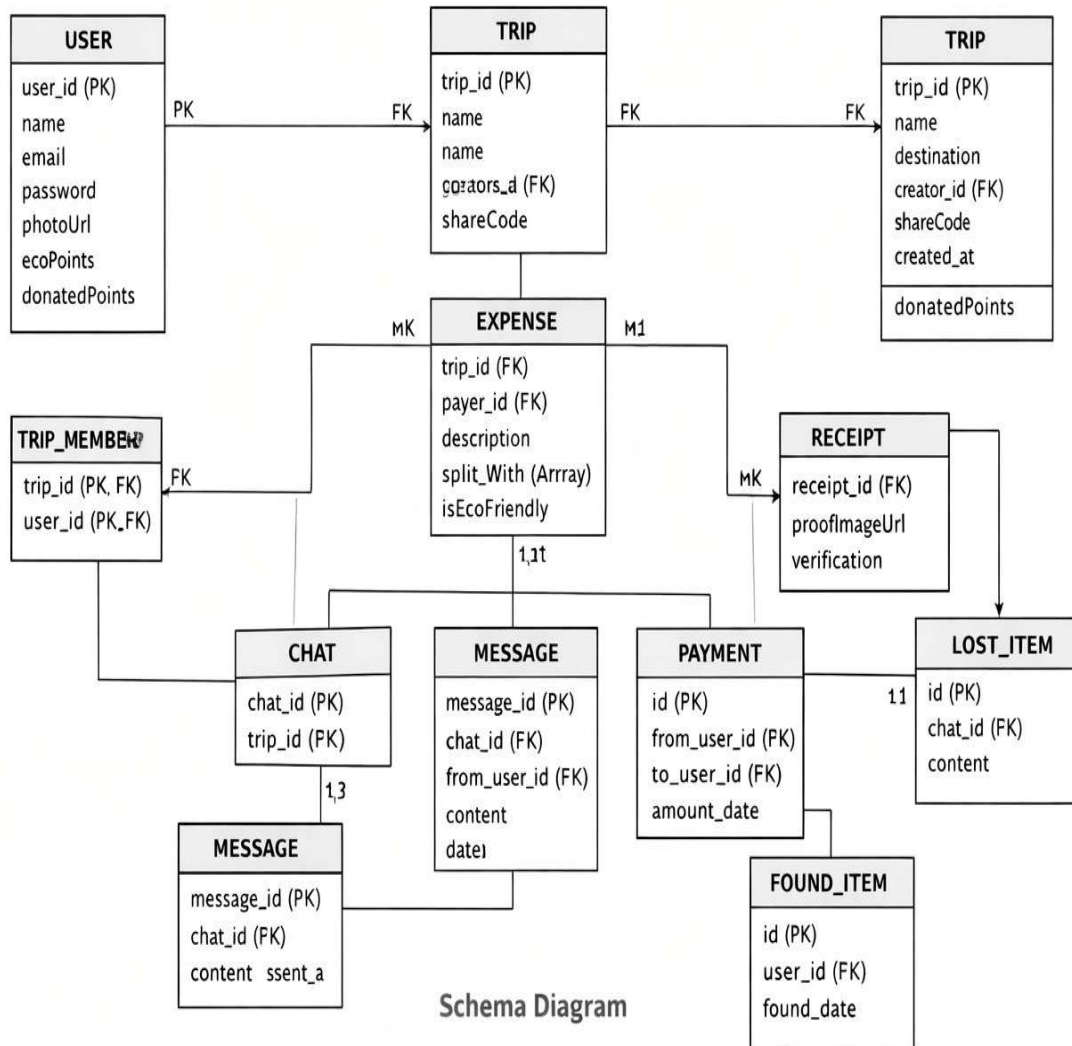
Optional Libraries & Tools

- Recharts (for data visualization)
- Postman (for API testing)

3. ER DIAGRAM OF THE PROJECT

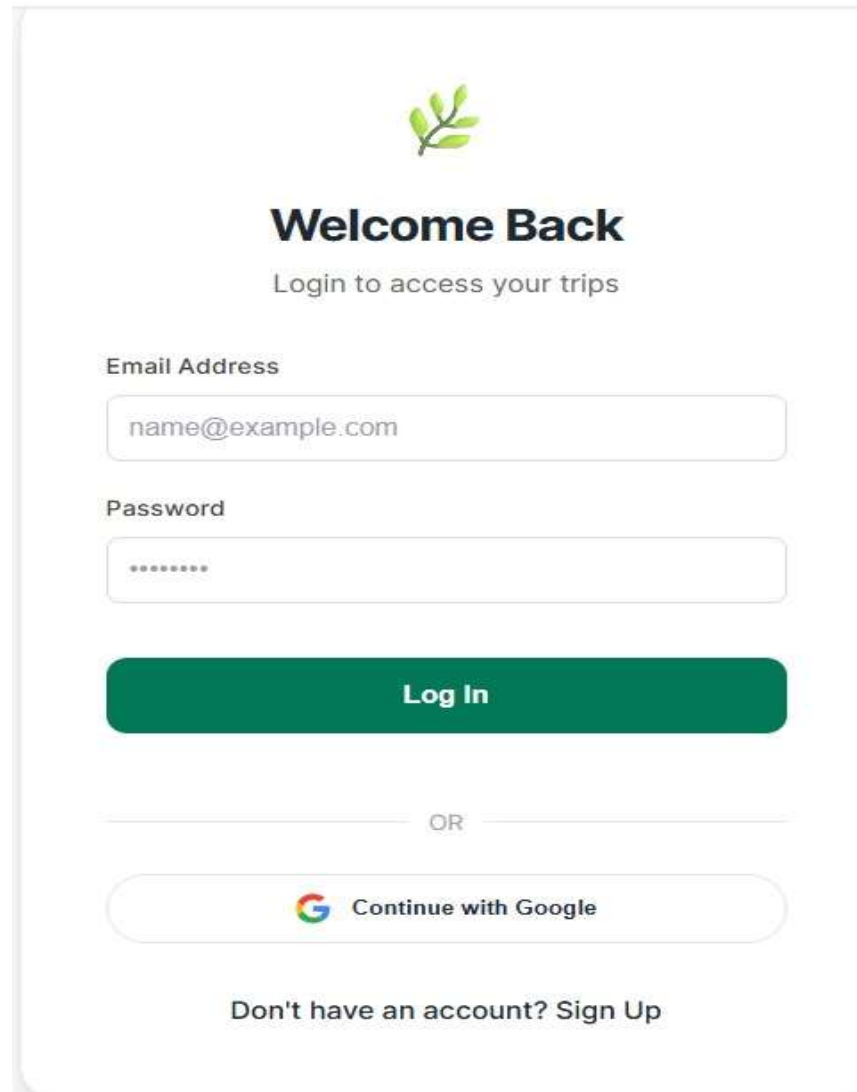


4. SCHEMA OF THE PROJECT




5. USER INTERFACE DESIGN

Login Page



The login page features a clean, modern design with a light gray background. At the top center is a green leaf icon. Below it, the text "Welcome Back" is displayed in a bold, dark font, followed by "Login to access your trips" in a smaller, lighter font. The form includes two input fields: "Email Address" with the placeholder "name@example.com" and "Password" with a masked password "*****". A prominent green "Log In" button is positioned below the password field. A horizontal line with the word "OR" in the center separates the login section from the "Continue with Google" button, which features the Google logo. At the bottom, a link reads "Don't have an account? Sign Up".



Welcome Back


Login to access your trips

Email Address

Password


Log In

OR

 Continue with Google

Don't have an account? [Sign Up](#)

Home Page


EcoShare

HomeAboutContactGet Started

Travel the World, Leave No Trace.


Plan collaborative trips, split expenses fairly, and track your carbon footprint. Join the community of conscious travelers today.

[Start Your Journey](#)




Easy Planning

Collaborate on itineraries in real-time with friends.



Fair Splitting


Track expenses and settle debts without the awkwardness.



Eco Insights

See the carbon impact of your travel choices and get rewards.

About Us Page

EcoShare

HomeAboutContactGet Started

About EcoShare


Empowering conscious travelers to explore the world while minimizing their carbon footprint.

Our Mission

At EcoShare, we believe that travel is one of the most enriching experiences a human can have. However, we also recognize the environmental impact that global travel has on our planet.

Our mission is to provide travelers with the tools they need to plan, track, and offset their travel-related emissions, all while making group travel and expense sharing seamless and fair.




Contact Us Page

[Home](#)[About](#)[Contact](#)[Get Started](#)

Get in Touch

Have questions or suggestions? We'd love to hear from you.

Contact Information

-  **Our Office**
B.M.S College Of Engineering
-  **Email Us**
ecoshare@gmail.com
-  **Call Us**
+91 9606343561


First Name

Last Name

Email Address

Subject

Profile Page

[Profile](#)[My Trips](#)[Impact](#)[Leaderboard](#)[Logout](#)

**Harsh Bafna**
harshbafna@gmail.in

12
ECO POINTS


0
DONATED

Recent Adventures

11/1/2026
Friends →

[View All History →](#)


My Earth Impact



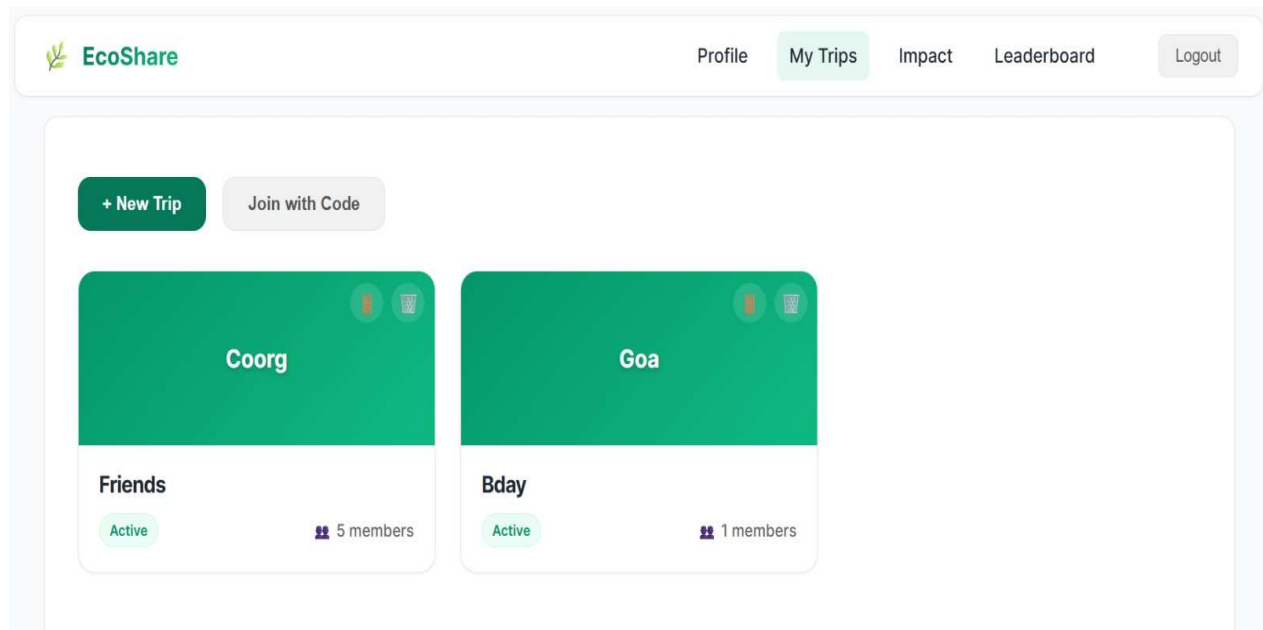
Next Goal

Gold Supporter Badge 12 / 500 pts

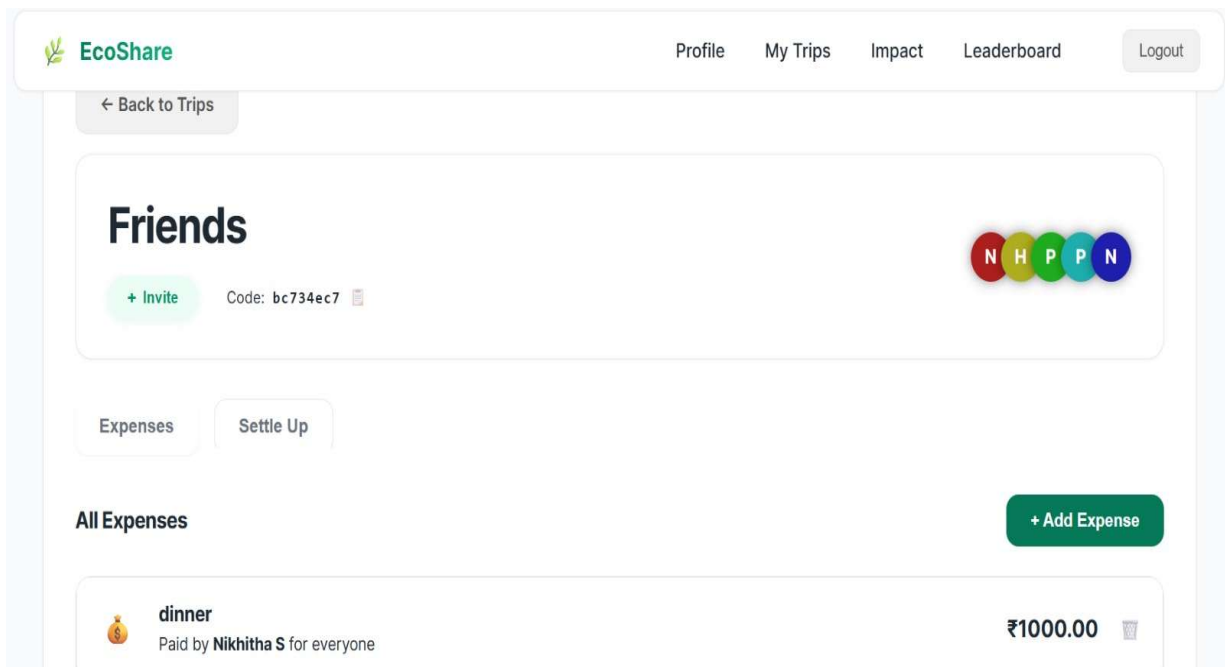
488 more points to unlock!

 **WIN A FREE TRIP**
Gold Supporters get a chance to win a
free volunteered trip or hike! In
collaboration with **VolunteerYatra**.

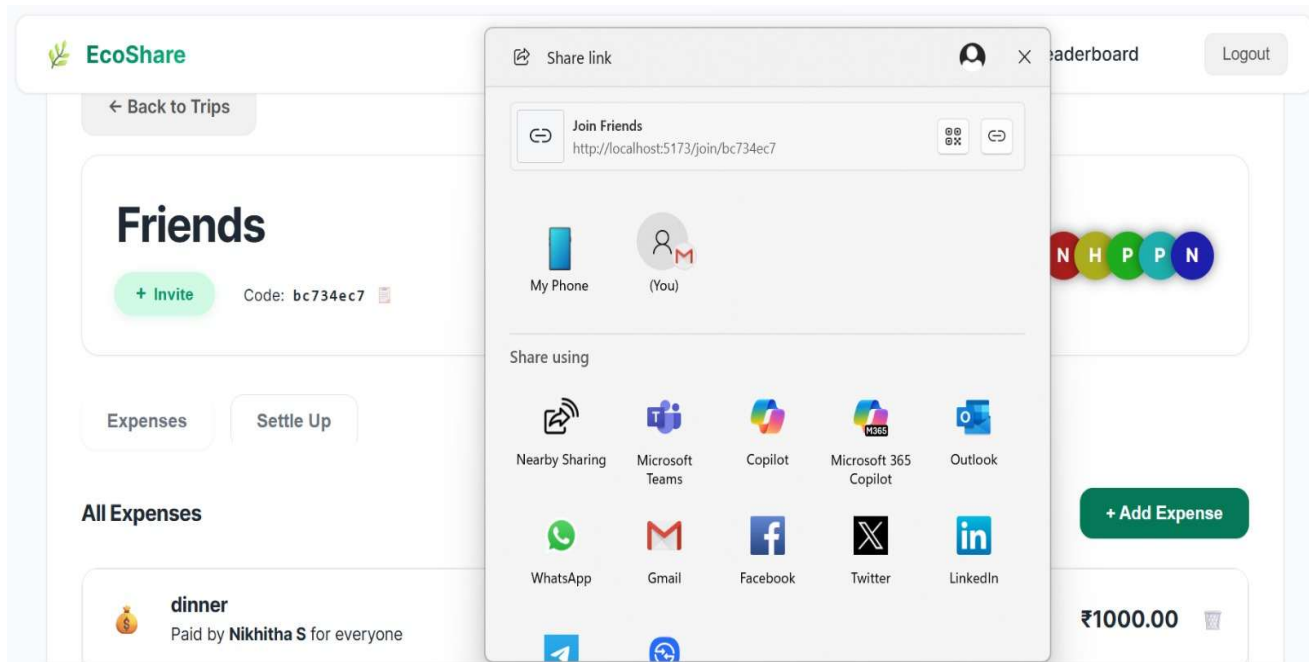
My Trips Page



Friends In Trip Page



Sharing Invite Code



Adding Expenses

EcoShare

Profile My Trips Impact Leaderboard Logout

All Expenses + Add Expense

Add New Expense

Description	Amount
travel	1460

PAID BY

☐ Nikhitha Shivakumar ☒ Harsh Bafna ☐ pavan ☐ panchami ☐ Nikhitha S


SPLIT WITH

☐ Nikhitha Shivakumar ☐ Harsh Bafna ☐ pavan ☐ panchami ☐ Nikhitha S

☒ This is an eco-friendly expense (+50 pts)

NONE

Verification Of Proof for Green Points

EcoShare

ProfileMy TripsImpactLeaderboardLogout

PAID BY

N Nikhitha Shivakumar

✓ Harsh Bafna

P pavan

P panchami

N Nikhitha S

SPLIT WITH

NONE

Nikhitha Shivakumar

Harsh Bafna

pavan

panchami

Nikhitha S

✓ 🌱 This is an eco-friendly expense (+50 pts)

📷 Verification Photo Required for Points

Choose File

No file chosen


🚨 Proof is mandatory for green points

💡 Tip: We also auto-detect keywords like "Cycle", "Bus", "Train", "Vegan".

Cancel

Save Expense

Splitting Up Expenses and Settling Up the Split

EcoShare

ProfileMy TripsImpactLeaderboardLogout

Expenses

Settle Up

Balances

<div>Nikhitha Shivakumar</div> <div>-292.00</div> <div>owes</div>	<div>Harsh Bafna</div> <div>+1168.00</div> <div>gets back</div>	<div>pavan</div> <div>-542.00</div> <div>owes</div>	<div>panchami</div> <div>-542.00</div> <div>owes</div>	<div>Nikhitha S</div> <div>+208.00</div> <div>gets back</div>
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How to Settle Up

Nikhitha Shivakumar pays Harsh Bafna

₹292

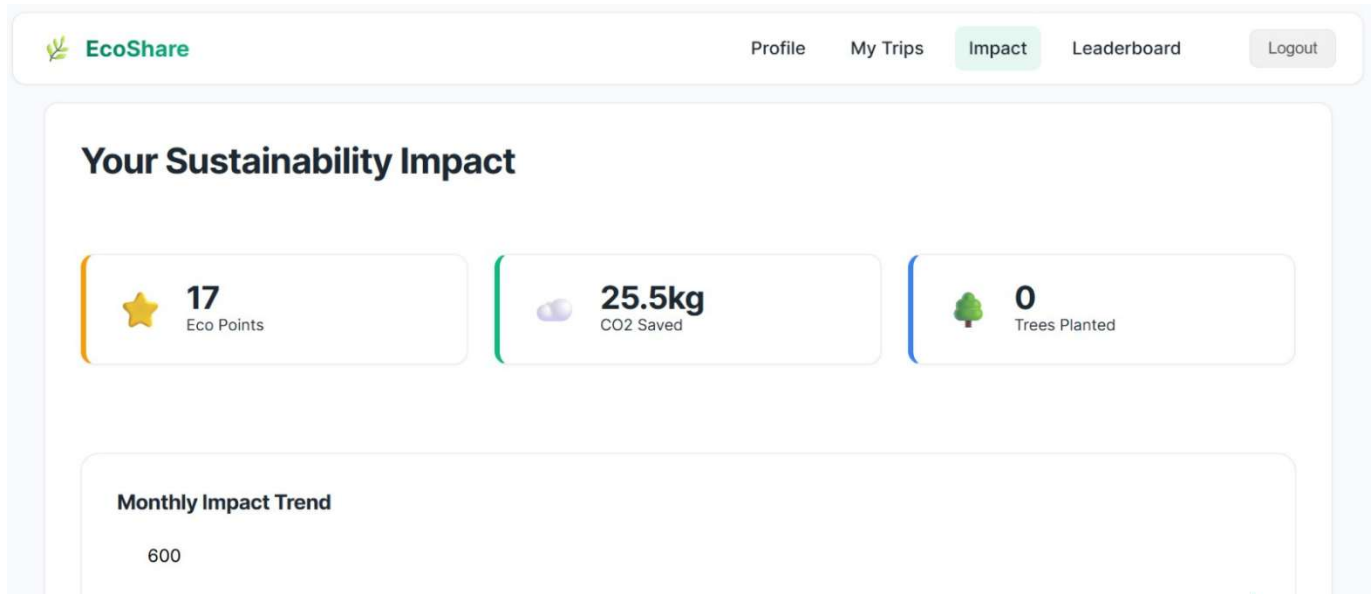
✓ Mark as Paid

pavan pays Harsh Bafna

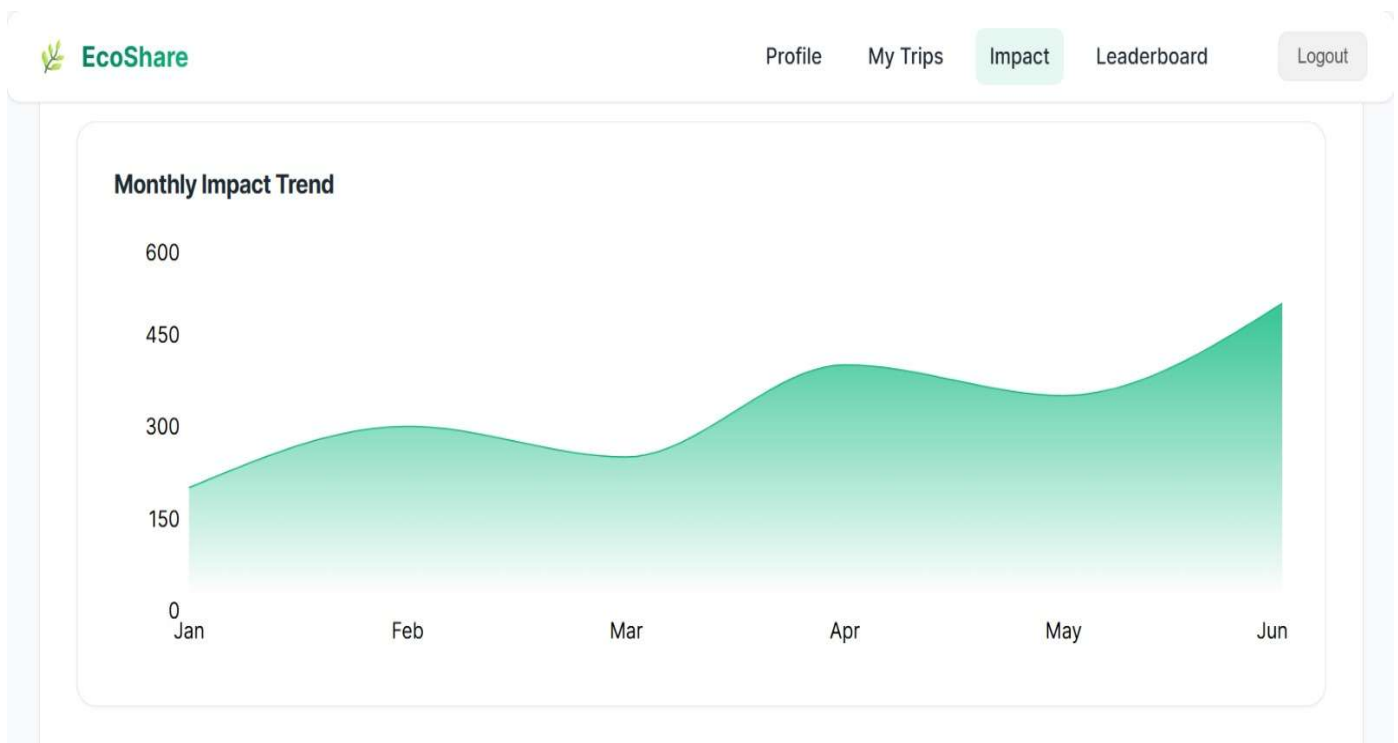
₹542

✓ Mark as Paid

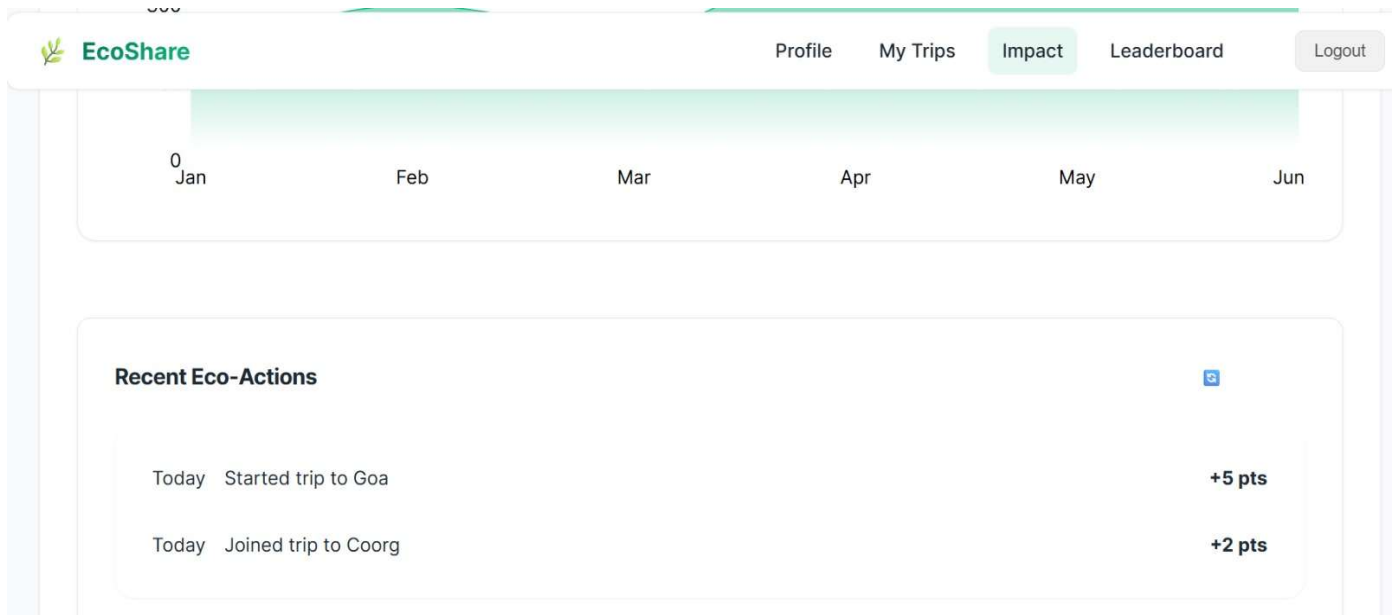
Impact Page



Impact Graph According To Green Points Acquired



Recent Eco- Actions

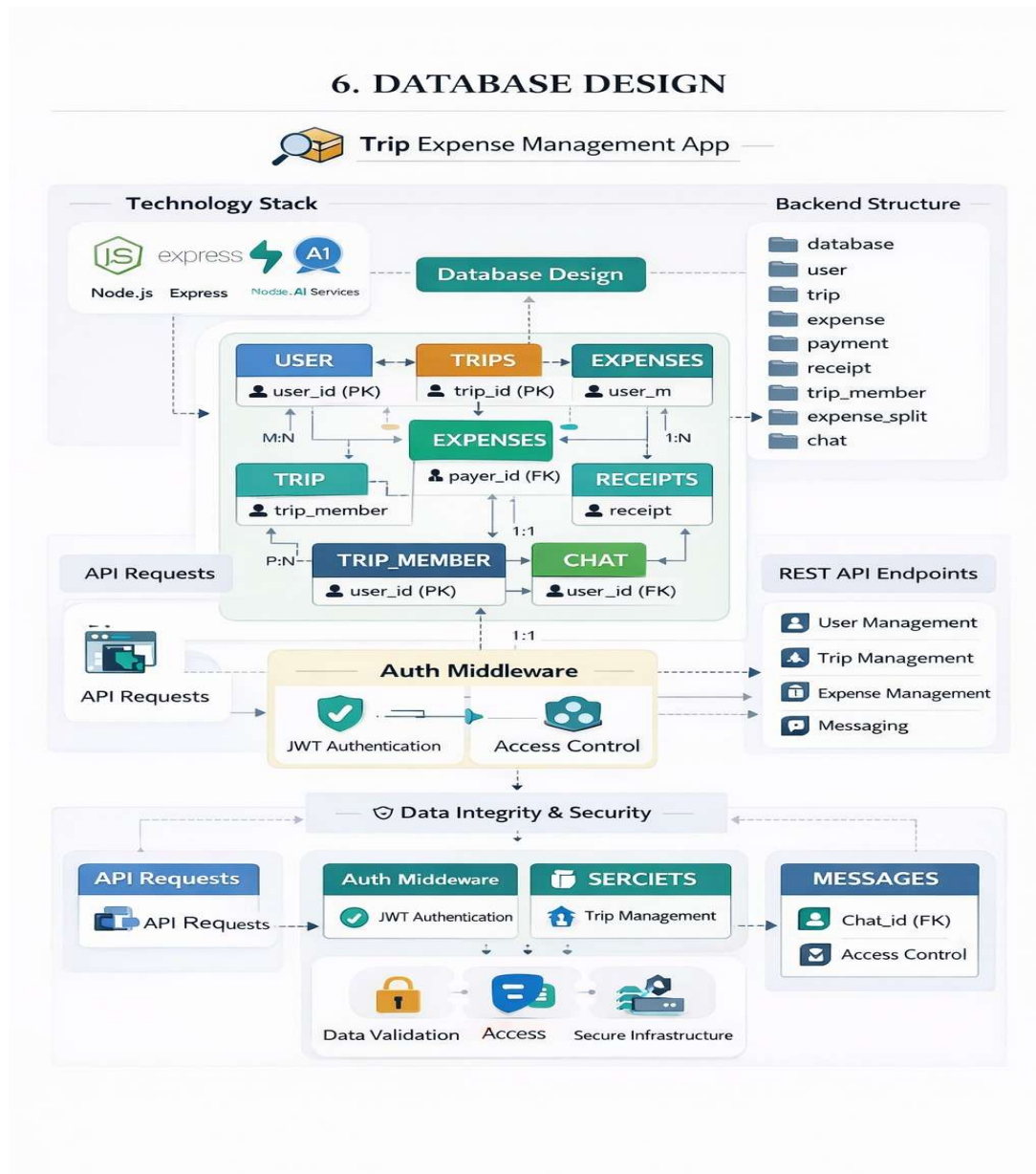


Leaderboard Page

The mockup shows the 'Leaderboard' tab selected in the top navigation bar. The main content area is titled 'Eco Champions' with a trophy icon and the subtitle 'See who is leading the sustainable movement.' Below this is a table of the top 8 users.

Rank	User	Green Points	Impact (Donated)
#1	Harsh Bafna	110	-
#2	Panchami P	110	-
#3	John	60	-
#4	Panchami P	60	-
#5	Harsh Bafna	17	-
#6	Nikhitha Shivakumar	15	-
#7	pavan	12	-
#8	panchami	12	-

6. BACK-END DESIGN



6.1 Overview

The backend of the Trip Expense Management and Lost & Found Web Application is designed to manage application logic, data storage, security, and communication between the frontend and the database. It follows a modular architecture to ensure scalability, maintainability, and efficient data handling.

6.2 Technology Stack

The backend is developed using:

Node.js for server-side execution

Express.js for RESTful API development

Database System for data storage

JWT for authentication and authorization

Cloud Storage for storing uploaded receipt images

6.3 Backend Architecture

The backend is organized into the following layers:

API Layer for handling client requests

Authentication Layer for secure access control

Business Logic Layer for processing application rules

Database Layer for data persistence

This layered architecture improves code organization and system scalability.

6.4 Database Design

The database consists of multiple interconnected entities:

User – Stores registered user details

Trip – Represents travel events created by users

Trip Member – Manages user participation in trips

Expense – Stores trip-related expenses

Expense Split – Divides expenses among users

Payment – Records settlements between users

Chat – Represents trip-specific conversation space

Message – Stores individual messages within a chat

Lost Item / Found Item – Manages lost and recovered items

6.5 Chat and Messaging Module

The Chat module enables communication between users participating in the same trip. Each trip has a dedicated chat, and multiple messages can be exchanged within it. This separation ensures organized communication and efficient message management.

6.6 Security and Scalability

Security is ensured using JWT-based authentication and access control mechanisms. The modular backend design supports scalability and allows easy integration of future features.

6.7 Summary

The backend design provides a secure and scalable foundation for the application by combining modular architecture, efficient database design, and reliable communication mechanisms.

7. CONCLUSION AND FUTURE WORK

CONCLUSION

EcoShare successfully combines **expense management with sustainability awareness**, offering a unique platform that simplifies group trip finances while promoting environmentally responsible behavior. By integrating modern web technologies with eco-intelligence, the application encourages transparency, collaboration, and positive environmental impact.

FUTURE ENHANCEMENTS

1. Integration with real CO₂ calculation APIs
2. Online payment gateway for settlements
3. Real-time notifications using WebSockets
4. Mobile application using React Native
5. AI-based eco-friendly recommendations
6. Integration with real NGOs for donations

8. REFERENCES

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