The Girl Code

SMART INDIA HACKATHON 2025

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- **Problem Statement ID** – SIH25009
- **Problem Statement Title** - Gamified Environmental Education Platform for Schools and Colleges
- **Theme** - Smart Education
- **PS Category** - Software
- **Team ID** - 24
- **Team Name** - The Girl Code

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ABOUT THE PROBLEM STATEMENT

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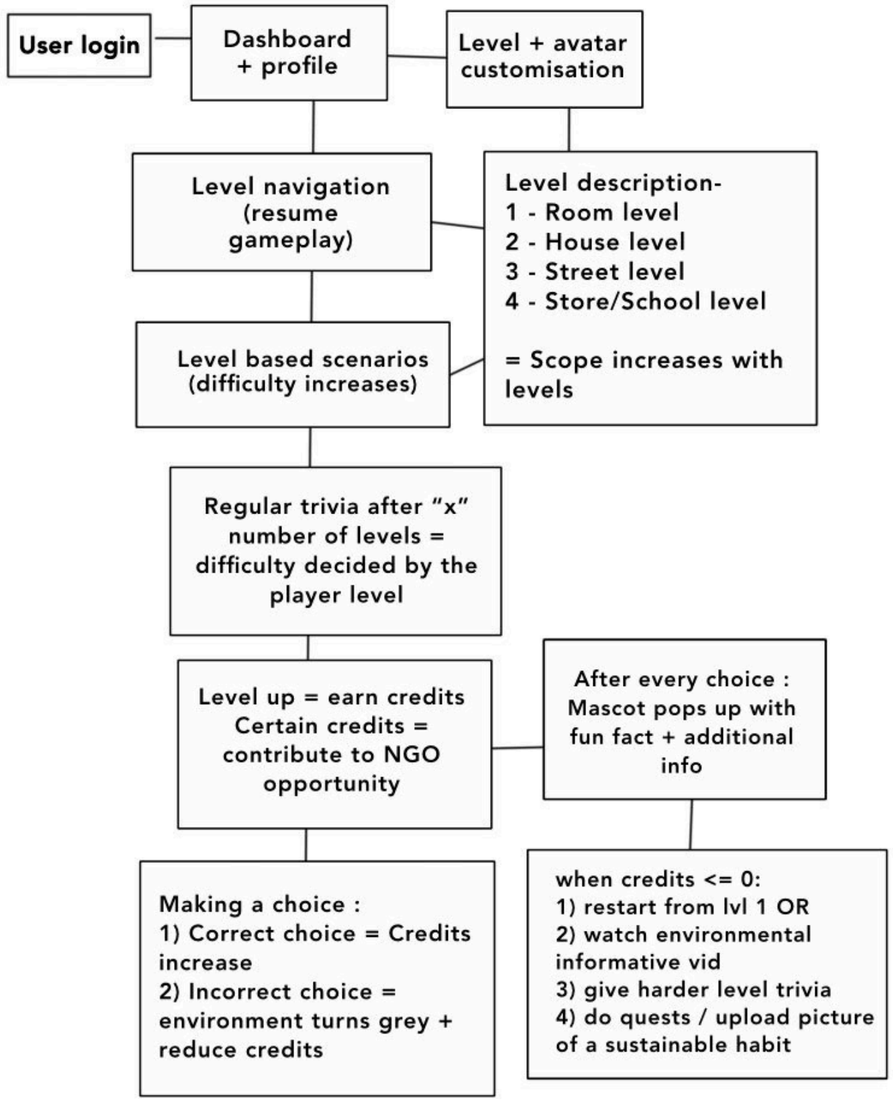
SOLUTION AND EXPLANATION



HOW IS THE PROBLEM ADDRESSED

- Educates users about sustainable habits through gamified environment and interactive learning.
- Real-time feedback(through mascots) shows how daily life decisions affects the ecosystem.
- Setback, level resets and drop-off of eco-points teach users about the consequences of bad sustainable habits.
- Makes learning fun & interactive through gamification rather than relying on rote textbook leaning.
- Peer activities like tree planting , beach cleanups links the game world to real-life
- Periodic quests/trivia to test and expand knowledge

INNOVATION & UNIQUENESS

- Unlike standard games, it links the users to real life eco-activities which make the learning practical
- Usage of gamification to actively promote sustainable habits and not just awareness.
- Peer collaboration encourages team work connecting digital world to social impact.
- Cognitive Skill Development:- Encourage problem solving & critical thinking through real-life scenario based challenges.
- Accumulated eco-points can be redeemed as vouchers or be used to connect with NGO's for volunteering and community projects
- Color changes (to grey) upon a bad choice

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TECHNICAL APPROACH

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1. Frontend (UI)
✧ **React.js** → Responsive & Interactive website.
✧ **Tailwind CSS** → Quick and clean styling + visually engaging user interface. .

2. Backend
✧ **Node.js + Express.js** → Handles game logic, level progression, Eco-points, and user management.

3. Database
✧ **MongoDB** → Stores user profiles, game progress, Eco-points, vouchers, and community activity data.

4. OPEN AI GPT API
✧ To generate dynamic hints or interactive prompts

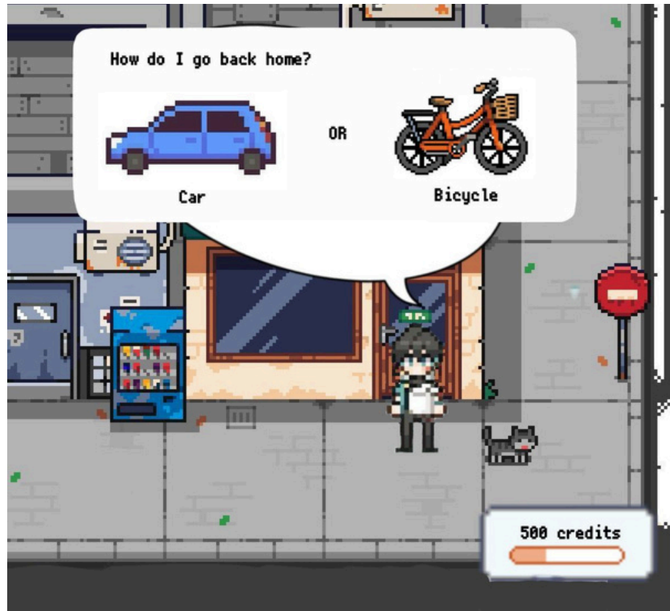
5. Hosting / Deployment
✧ **Vercel** → Host frontend
✧ **Render / Railway** → Host backend + MongoDB

6. Offline assistance
✧ **Firebase** → Real-time updates and notifications

7. Digital pixel art
✧ **IBIS paint/Procreate →** To make visually appealing backgrounds/mascot etc

- **LV-1 : Sustainability at home**
- Navigate through room to complete eco-friendly tasks
- Each action teaches energy conservation

- **LV-2 : Sustainability in streets (society)**
- Player chooses option which will impact the background (surrounding)
- This encourages users to make sustainable choices



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FEASIBILITY AND VIABILITY

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FEASIBILITY AND VIABILITY

TECHNICAL FEASIBILITY :

- Frontend (React.js, Tailwind CSS) creates an interactive, responsive, and animated interface.
- Backend (Node.js + Express.js) with MongoDB manages game logic, Eco-points & user data

OPERATIONAL FEASIBILITY :

- Simple, intuitive design with clear visual cues.
- Minimal technical support needed; user-friendly design.

SOCIAL FEASIBILITY :

- Educates users about eco-friendly decisions
- Can be integrated into schools, colleges to raise environmental awareness

POTENTIAL CHALLENGES

1) Ensuring game runs smoothly on all devices (compatibility)

2) Keeping players motivated to play the game on regular basis

3) Storing user choices, eco-points, and progress reliably

4) Managing backend performance if multiple users play simultaneously (aka avoiding traffic)

OVERCOMING CHALLENGES

Sustaining Player Motivation

Leaderboards, badges, streaks, and milestones

DATA SECURITY

Secure user data and progress

Cross-Platform Compatibility

Responsive web design and progressive web app features

BACKEND SCALABILITY

Plan for high traffic and use cloud services

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IMPACT AND BENEFITS

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POTENTIAL IMPACTS

- Increased environmental awareness
- Brings into realisation that even small decisions contribute to environment conditions on a large scale
- Long term benefits and habits induced in routine
- Creates a sense of shared responsibility for the planet
- Promotes growth of NGOs and volunteers

SOCIAL BENEFITS

- Educates players about eco-friendly choices in an interactive way.
- Encourages participation in social activities & volunteering linked to Eco-points.

ECONOMIC BENEFITS

- Redeemable vouchers linked to NGOs create economic value by supporting NGO programs
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ENVIRONMENTAL BENEFITS

- Raises awareness about environmental issues and motivates sustainable decision-making in daily life.
- Supports real-world impact through eco-friendly choices.

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RESEARCH AND REFERENCES

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✧The Game with Impact: Gamification in Environmental Education and Entrepreneurship
https://www.researchgate.net/publication/363014083_The_Game_with_Impact_Gamification_in_Environmental_Education_and_Entrepreneurship

✧ Gamified Learning for Sustainability: An Innovative Educational Framework
https://www.mdpi.com/2071-1050/17/6/2694

✧Educating for Sustainability through Gamification: Exploring Challenges and Opportunities
https://www.imanagerpublications.com/article/21580