EcoEcho

EcoEcho is a civic-tech platform that bridges the gap between citizens, their city government, and the environment.

Our system turns real, data-driven environmental insights into actionable community tasks. Citizens can browse a "task marketplace" (e.g., "Plant trees in a specific heat-island zone"), complete the task, and earn real rewards from the city.

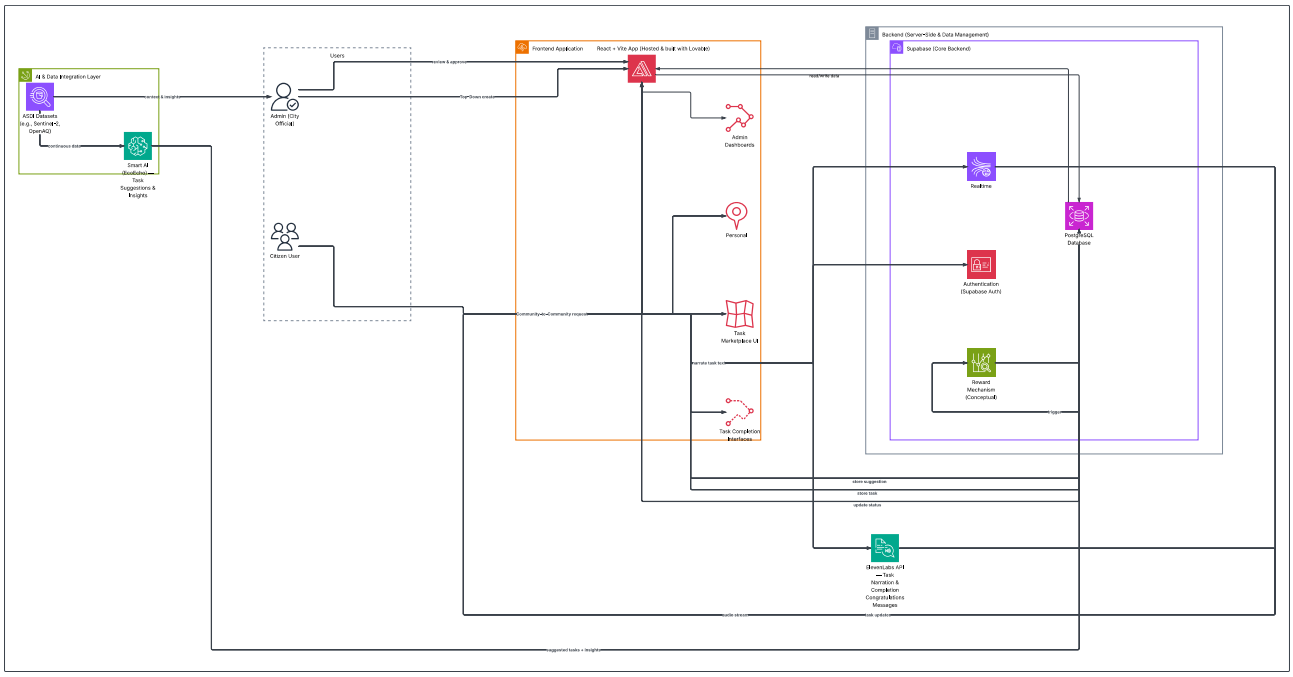
The user flow is simple:

1. **AI-Generated Insights:** Our concept is built on analyzing **Amazon Sustainability Data Initiative (ASDI)** datasets. This data supports the detection of real-world challenges such as rapid urban expansion, by leveraging Sentinel-2's high-resolution imagery or air quality hotspots (from OpenAQ).
2. **Task Creation (Officials):**

   Our platform's task-creation system is designed to empower everyone (officials, citizens, and our "smart" AI to take action). Tasks can be created in three distinct ways:

   1. Top-Down (Official Tasks): City officials can directly create and publish "smart tasks" for the community, such as "Plant 10 trees at [location]," based on their own city goals.
   2. Bottom-Up (Citizen Suggestions): Citizens can act as the "eyes on the ground," suggesting tasks for the government (e.g., "A new illegal dumpsite found here"). These suggestions are sent to the admin dashboard for approval before being published as official tasks.
   3. Community-to-Community (Requests): Citizens can post individual requests for help (e.g., "An elderly neighbor needs someone to take his dog for a walk"), which are posted immediately to the Task tab for other community members to accept.
   4. "Smart" AI suggestions: Our application also has a specialised AI that constantly scans some of the ASDI datasets and based on that provides suggestions to officials which then they can approve or reject.
3. **Task Completion (Citizens):** Citizens log in, accept a task, and complete it.
4. **Verification & Rewards:** After marking the specific task as completed, if an official approves it on their Admin dashboard, then the citizen receives their reward (e.g., a free transport pass).

Architectural Diagram



How Each Technology is Used (Key Roles)

Here is the "cheat sheet" for what each service does in EcoEcho project:

1. Lovable (The AI Developer & Host)

- **What it does:** Lovable acted as our AI-assisted development teammate. We provided it with high-level instructions, and it generated the entire, production-ready React + Vite frontend for our application.
- **Key Role:** It also serves as our hosting and deployment platform. The finished application is deployed live on Lovable's infrastructure.

2. Supabase (The Backend Brain which Lovable uses)

- **What it does:** Supabase is our all-in-one backend. It handles all critical data and logic.
- **Key Roles:**
  - **Authentication:** Manages all user signups and logins securely.
  - **Database:** Stores all our data in its PostgreSQL database (e.g., the profiles table, tasks table, and user_tasks to link them).

3. ElevenLabs Features

- **What it does:** This is our "wow" feature for accessibility and engagement.
- **Key Role:** When a user views a task, they don't just have to read the description. They can click a button to hear a clear, human-like AI voice (powered by ElevenLabs) explain the task's importance. This makes the app more accessible

and personal. The ElevenLabs voice is also used at the end of task completion to narate specific congrationulations message to each user after completing task.

4. ASDI (The Insight Engine)

- **What it does:** This is the conceptual data source that makes our app "smart."
- **Key Role:** While our demo app has manually-entered (hardcoded) tasks insights, the **ASDI Insight** field for each task (e.g. “Sentinel-2 derived land cover maps show that built-up areas increased by 15.05%, while vegetation cover decreased by 29.93% in the region between 2016 and 2023. “) proves that tasks in real product ready application will not be random. They will be based on real environmental data, solving real problems.