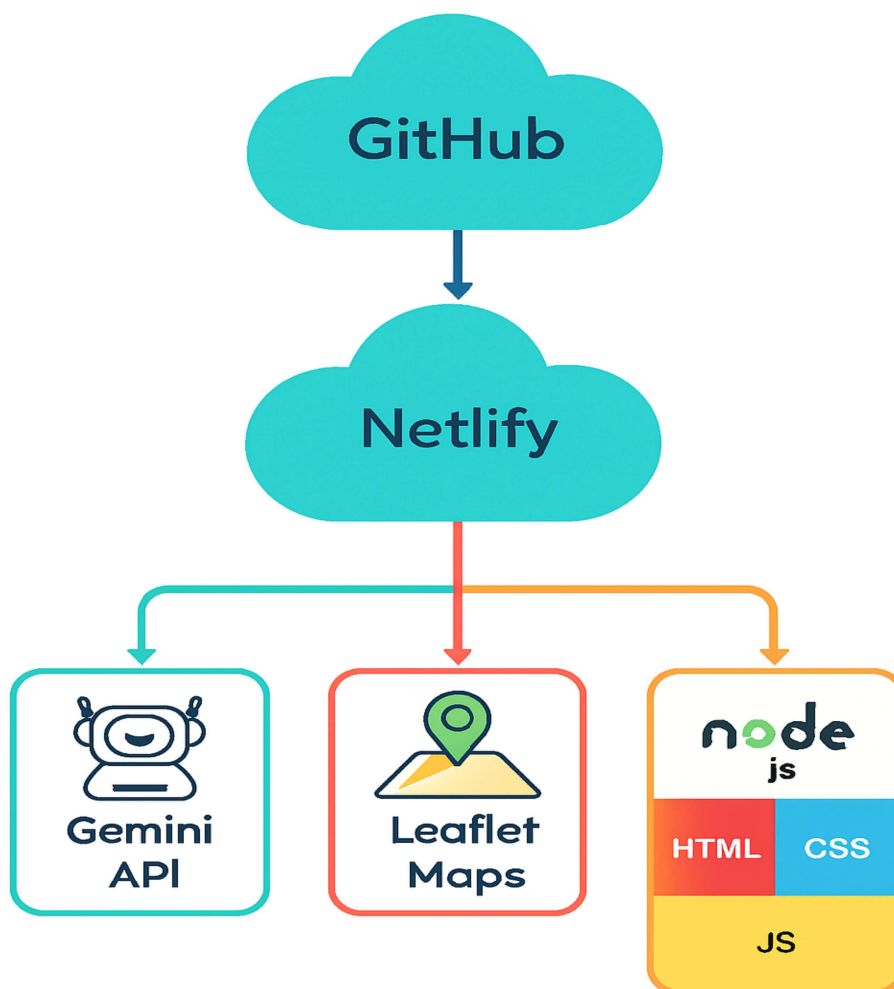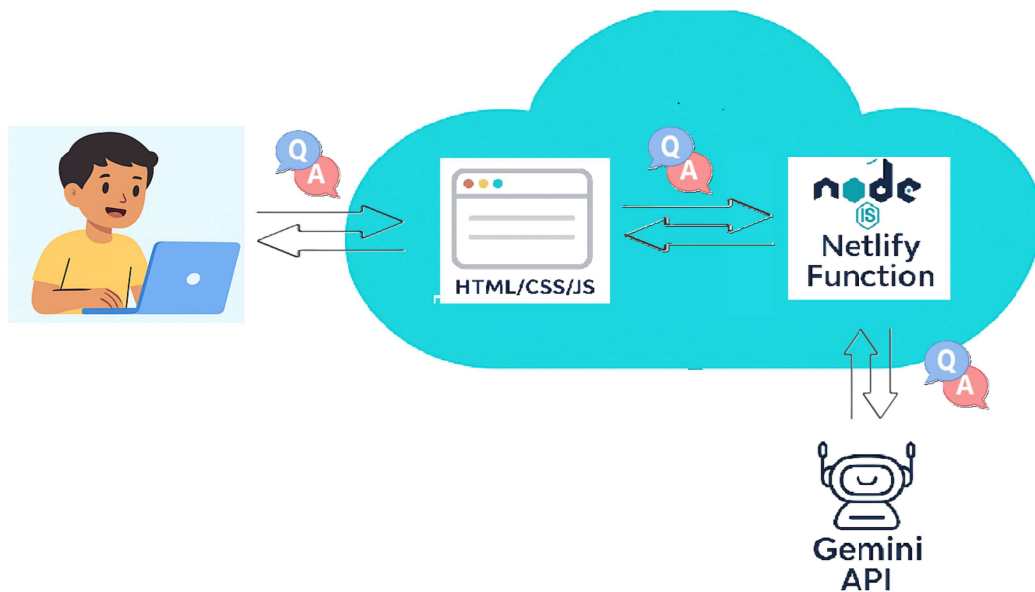# Padhaneer Connect Technical Documentation

Project Overview

- Uses **HTML/CSS/JS** for the frontend
- Displays Palm Guardians (tappers, activists, advocates) on a **Leaflet map**
- Uses **Gemini AI** to answer questions about PadhaNeer and Palmyra culture
- Runs on **Netlify**, a platform that hosts websites and serverless functions
- Uses **Node.js** for backend logic

PadhaNeer Connect : Tools and Technologies

Ask PadhaNeer Bot: Architecture

Key Technologies Explained

GitHub is a free online platform used to store and manage code. It helps developers and students:

- **Track changes** to their code over time

- **Collaborate** with others on the same project

- **Share** their work publicly or privately

- **Deploy** websites and apps directly to platforms like Netlify

GitHub uses a system called **Git**, which is like a smart history tracker for your code. Every time you make changes, you can "commit" them — like saving a version — and go back later if needed.

Why Use GitHub in PadhaNeer Bot?

In PadhaNeer Connect project, GitHub helps you:

- Keep all your code organized in one place

- Work with other students, developers, or activists

- Automatically deploy updates to your live site on Netlify

- Make the project open-source so others can learn or contribute

Is GitHub Safe

Yes. GitHub is trusted by millions of developers worldwide. Sensitive information like your Gemini API key is **never stored in GitHub** — it's kept in **environment variables** on Netlify, which are encrypted and secure.

Netlify Functions

- A **Netlify Function** is a small backend program that runs on Netlify's servers.
- It's written in **Node.js** and responds to web requests.
- In this project, it sends your question to Gemini AI and returns the answer.
- It's **serverless**, meaning you don't manage any servers — Netlify handles it.

Environment Variables

- Your Gemini API key is **private and sensitive**.
- Instead of writing it in your code, you store it in an **environment variable**.
- Netlify keeps this key **encrypted and secure**.
- This prevents others from stealing your API key or misusing it.

Gemini API

- Gemini is Google's **AI model** that understands and generates human-like text.
- You send it a question, and it replies with a smart answer.
- It's accessed through a **web API** — a special URL that accepts requests and returns responses.
- You need an **API key** to use it, which proves you're allowed to access the service.

Node.js

- Node.js is a way to run JavaScript on the **server**, not just in the browser.
- It's used to write backend logic — like your Netlify Function.
- It handles things like sending requests to Gemini and formatting the response.

HTML + CSS + JavaScript

- **HTML** creates the structure of your webpage (text boxes, buttons, etc.)
- **CSS** styles your page (colors, fonts, layout)
- **JavaScript** adds interactivity — like sending the question to Gemini and showing the answer

Leaflet Maps

- Leaflet is a free JavaScript library for interactive maps.

- You use it to show **Palm Guardians** (tappers, activists, advocates) on a map.
- Each guardian has a **location marker** and contact info.

Tool/Platform	Purpose
GitHub	Stores and manages your code
Netlify	Hosts your website and backend functions
Gemini API	Provides AI answers to user questions
Leaflet Maps	Displays Palm Guardian locations on an interactive map
Node.js	Runs backend logic (Netlify Functions)
HTML/CSS/JS	Builds the user interface

Netlify Function vs Python Backend

Feature	Netlify Function (Node.js)	Python (Flask/Django)
Setup	Instant — just drop a .js file	Requires server setup or platform config
Hosting	Built into Netlify (free tier available)	Needs external hosting (Heroku, AWS, etc.)
Language	JavaScript (Node.js)	Python
Speed for small tasks	Very fast for short, simple logic	Slightly heavier for small tasks
Scalability	Auto-scales with Netlify	Depends on hosting provider
Best for	Web apps, chatbots, form handling	Data-heavy apps, ML models, complex APIs
Security	Environment variables are encrypted	Also secure, but needs manual setup

<u>Limitations</u>

- Gemini API has **rate limits** and **token limits**
- Free tier may restrict **daily usage**
- Leaflet map is **static** unless connected to a database

Additional Inforamtion

What Is an API? (Application Programming Interface)

An API is like a messenger between two apps. It lets one app ask another app for information or tell it to do something — without needing to know how it works inside.

How It Works in PadhaNeer Bot

- **Your website** sends a question to the **Gemini API**

- **Gemini AI** thinks and replies with an answer

- You never see Gemini's internal code — just the result

   Why APIs Are Useful

- ✓ They let apps **talk to each other**

- ✓ They keep things **secure and organized**

- ✓ You can build cool features like:

     - Chatbots

     - Maps

     - Payments

     - Weather updates

     - Translation tools