Healthcare Translation Web App with Generative AI – Project Documentation

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1. Project Overview

The **Healthcare Translator Web App** is a web-based application designed to help patients and healthcare providers communicate in real-time across multiple languages. The app converts spoken input into text, translates it using **Generative AI (OpenAI GPT-4o-mini)**, and provides audio playback of the translated text. It is optimized for both **mobile and desktop** use.

Objectives:

- Enable real-time speech-to-text transcription.
- Accurately translate medical terminology across multiple languages.
- Provide audio playback for translated text.
- Ensure a **mobile-first responsive design** for easy accessibility.

Live Demo: https://healthcare-translator-mu.vercel.app

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2. Project Structure

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healthcare-translator/
├── client/          # React frontend (Vite)
│   ├── src/
│   │   ├── main.jsx     # Entry point of React app
│   │   └── App.jsx      # Main UI component with voice-to-text,
translation, and audio playback
│   └── package.json
├── server/          # Node.js + Express backend
│   ├── index.js         # API server with /translate endpoint
│   ├── package.json
│   └── .env             # Environment variables (OpenAI API key)
└── README.md         # Project setup, usage, and features
```

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3. Tech Stack

- **Frontend:** React (Vite)
- **Backend:** Node.js + Express
- **AI Tools:** OpenAI GPT-4o-mini for translation, ChatGPT for code assistance
- **APIs:** Web Speech API (voice-to-text), Web Speech Synthesis API (audio playback)
- **Deployment:** Vercel (frontend), Render(backend)
- **Others:** dotenv (for environment variables), CORS, nodemon

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4. Features

1. **Voice-to-Text Transcription** – Convert spoken input into live text.
2. **Real-Time Translation** – Translate text into the selected language using GPT-4o-mini while preserving medical accuracy.
3. **Audio Playback** – Users can listen to the translated text using the “Speak” button.
4. **Mobile-First Design** – Optimized for all devices.
5. **Language Selection** – Users can choose both input and output languages easily.

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5. Usage Guide

1. Open the web app in a browser.
2. Select the **target language** from the dropdown menu.
3. Speak using the **microphone button** or type text manually.
4. Click **Translate** to generate the translated text.
5. Click **Speak** to listen to the translated audio.

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6. AI Tools & Prompts

- **OpenAI GPT-4o-mini** – Provides accurate multilingual translation of medical text.
- **ChatGPT / Copilot** – Assisted in generating React components, API endpoints, and integration logic.

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7. Security & Privacy

- **API keys** are stored in `.env` and never pushed to GitHub.
- **CORS** is configured to allow only frontend origin.
- **No patient data** is stored on the server.

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8. Deployment

- **Frontend:** Deployed on Vercel → https://healthcare-translator-mu.vercel.app
- **Backend:** Deployed on Render

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9. Submission-

- **GitHub Repo:** **https://github.com/Divzdj/healthcare-translator**
- **Live App:** https://healthcare-translator-mu.vercel.app