



UMHackathon 2025

GrabMate

Empowering drivers with a seamless hands-free experience smart voice with control to help them stay focused, safe, and in control while on the road.



Presented by:

Team Ctrl+C Ctrl+V

Problem Overview

The Problem:

Grab drivers currently use a text-based interface. This is impractical and unsafe when driving.

Our Goal:

Build a a hands-free AI assistant for Grab drivers that works reliably in noisy, real-world conditions and understands diverse accents and speech patterns.

Our Team

Ctrl+C Ctrl+V



UMHackathon 2025



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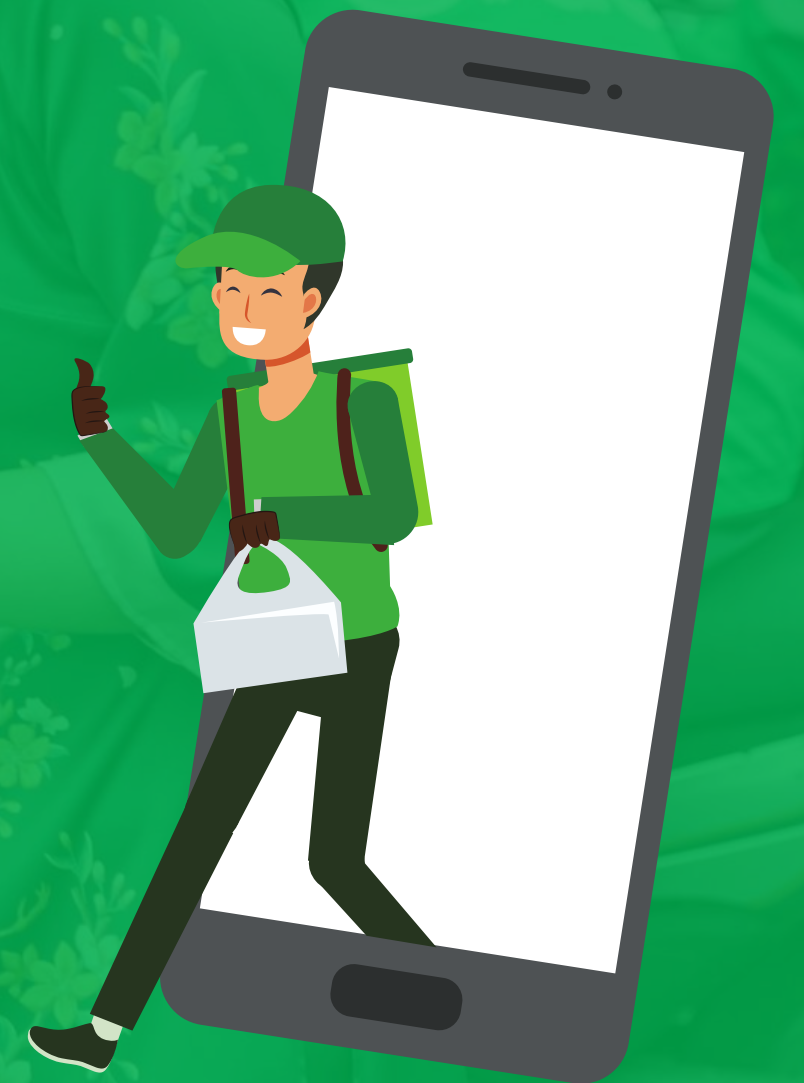


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Key Features

- Mobile App Compatible
- Full Conversational Flow
 - Text-to-Speech
 - Speech-to-Text
- Translation
- Noise Cancellation
- Enhance Voice Recognition Techniques
- Adapt to Diverse Southeast Asia Language
 - Including English, Chinese, Malay, Tamil, Indonesian, Thai, Filipino (Tagalog), Vietnamese
- Partial Audio Clarity
- Adaptable to Various Environmental Conditions
- Response in Spoken Language
- Map Display & Basic Navigation UI
- Route Display & Rerouting
- Ride Acceptance Workflow
- Customer/ Destination Coordinate Fetching
- Basic Step-by-Step Display

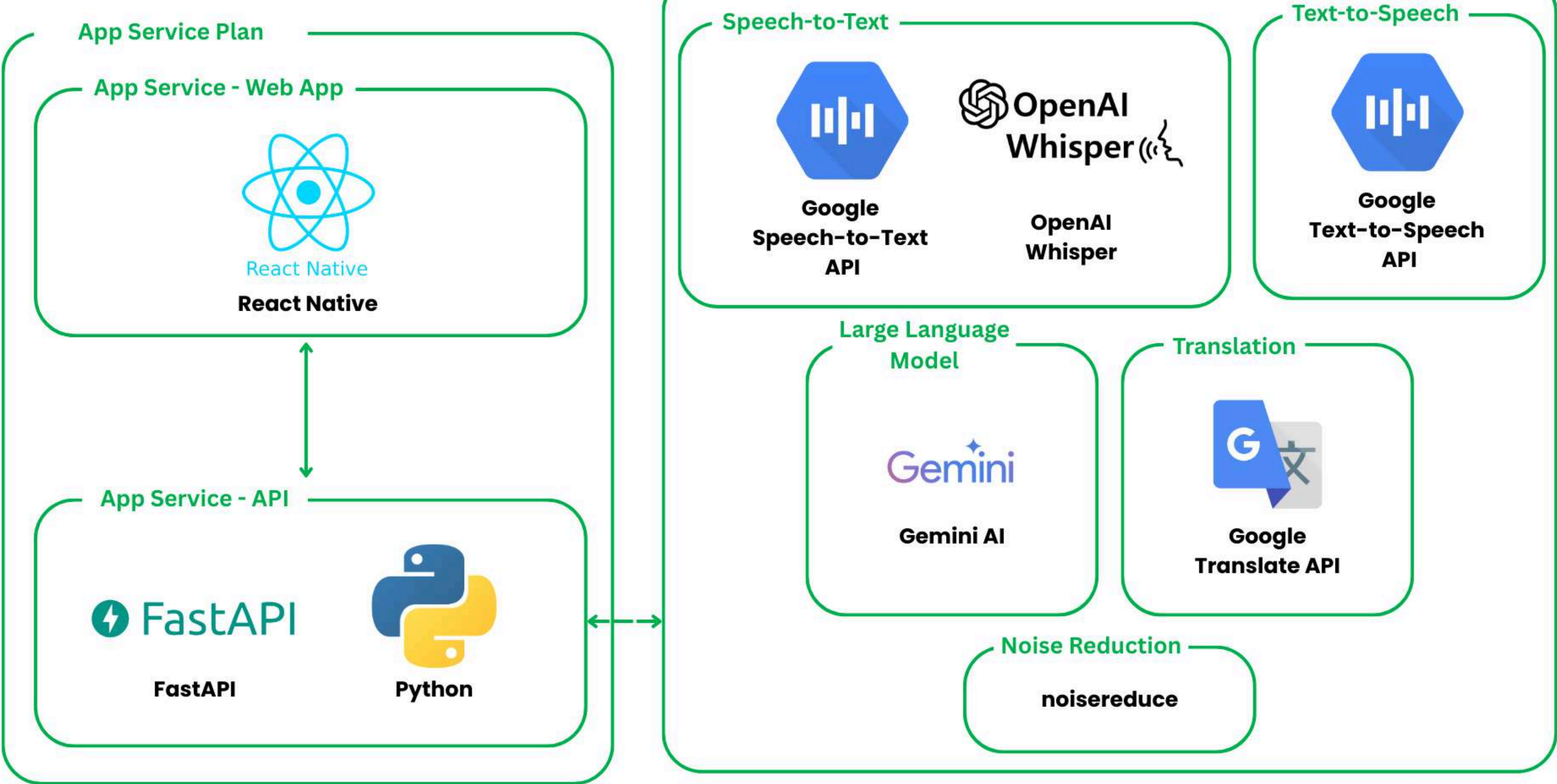


Ongoing Key Feature

- NLU and Intent Handling
- Message Sending
- Ask Gate Info
- Flood Check
- Reroute Check
- Drowsiness Detection
- Yawn Detection
- Crash Detection Handling
- Chat History



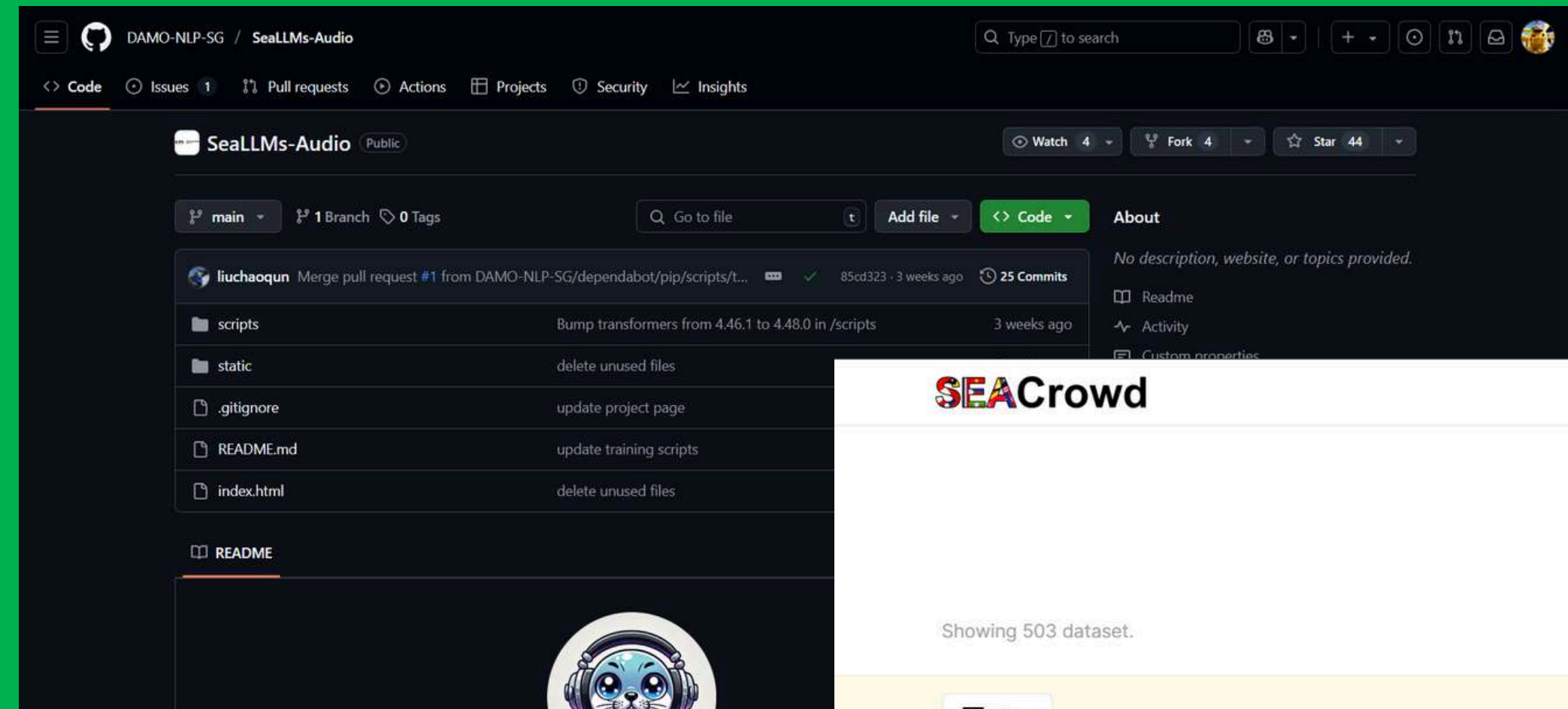
Techstack Architecture



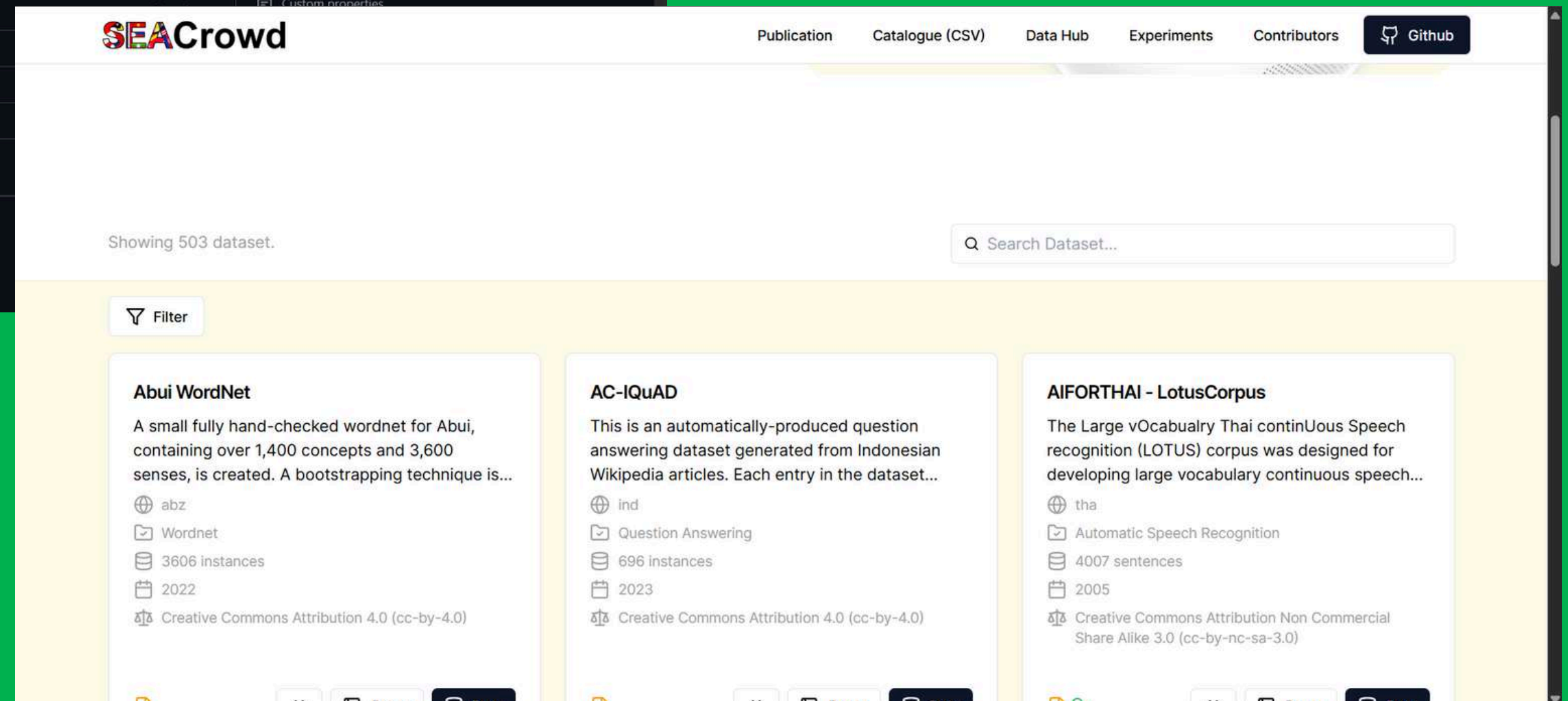
Backend Implementation

–Initial–

SeaCrowd



SeaLLM



**Detect the
language spoken
using Google STT**

**Language
detected?**

YES

**Continue to the
next steps**

NO

**Use WhisperAI
as fallback**

**Transcribe
the speech
to text**

Final Backend Implementation Flow

**Attempt Google
Speech-to-Text
API**

**Noise
Reduction**

**Decode
audio to
base64**

**Receive audio in
any format**

**Partial Audio
Clarity
Improvement**

**Translate the
transcript to
English**

**LLM
understand
user's
intent**

**Handling
Intent**

**Format and
Return**

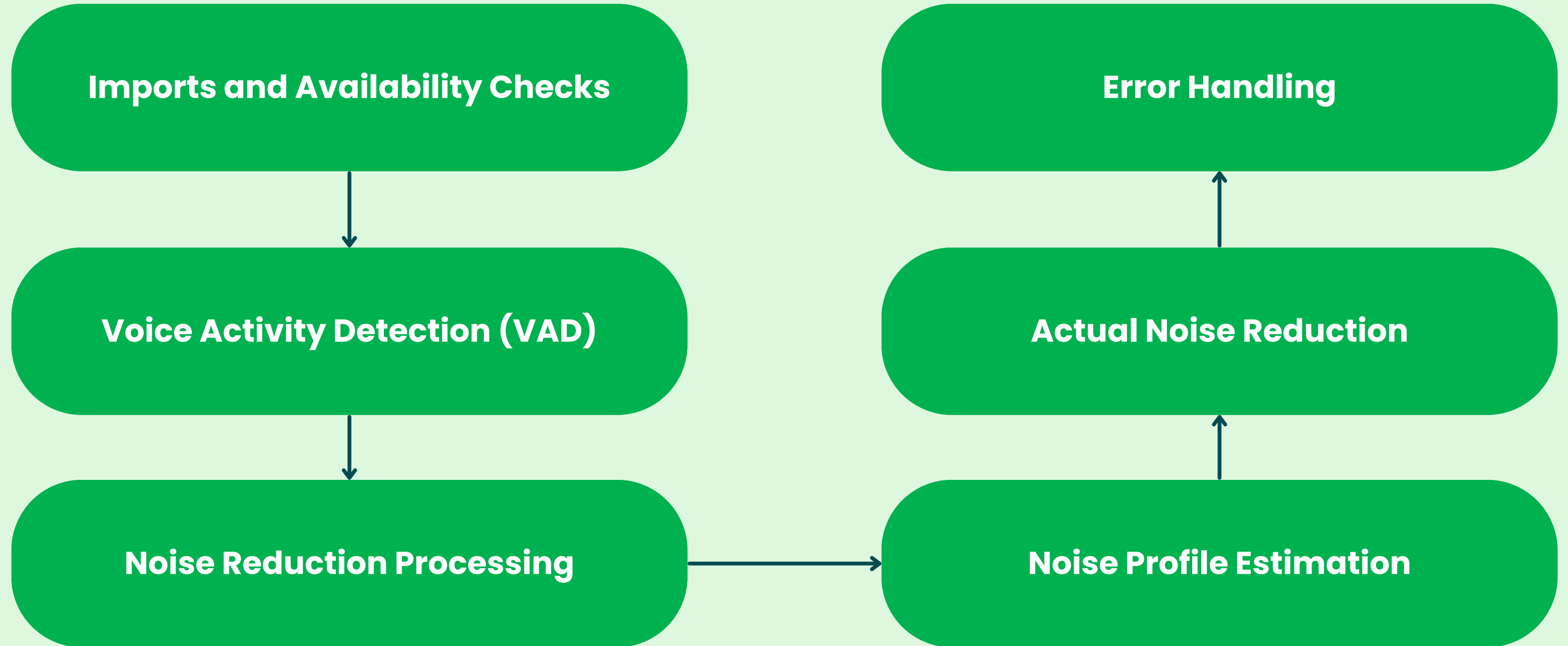
**Update Chat
Memory**

**Translate the response
back to the original input
language**

**Read out the
output**

**Final
Implementation Flow**

Noise Reduction



Noise Reduction

Thai Language in Rainy Conditions

Input Audio



Output Audio



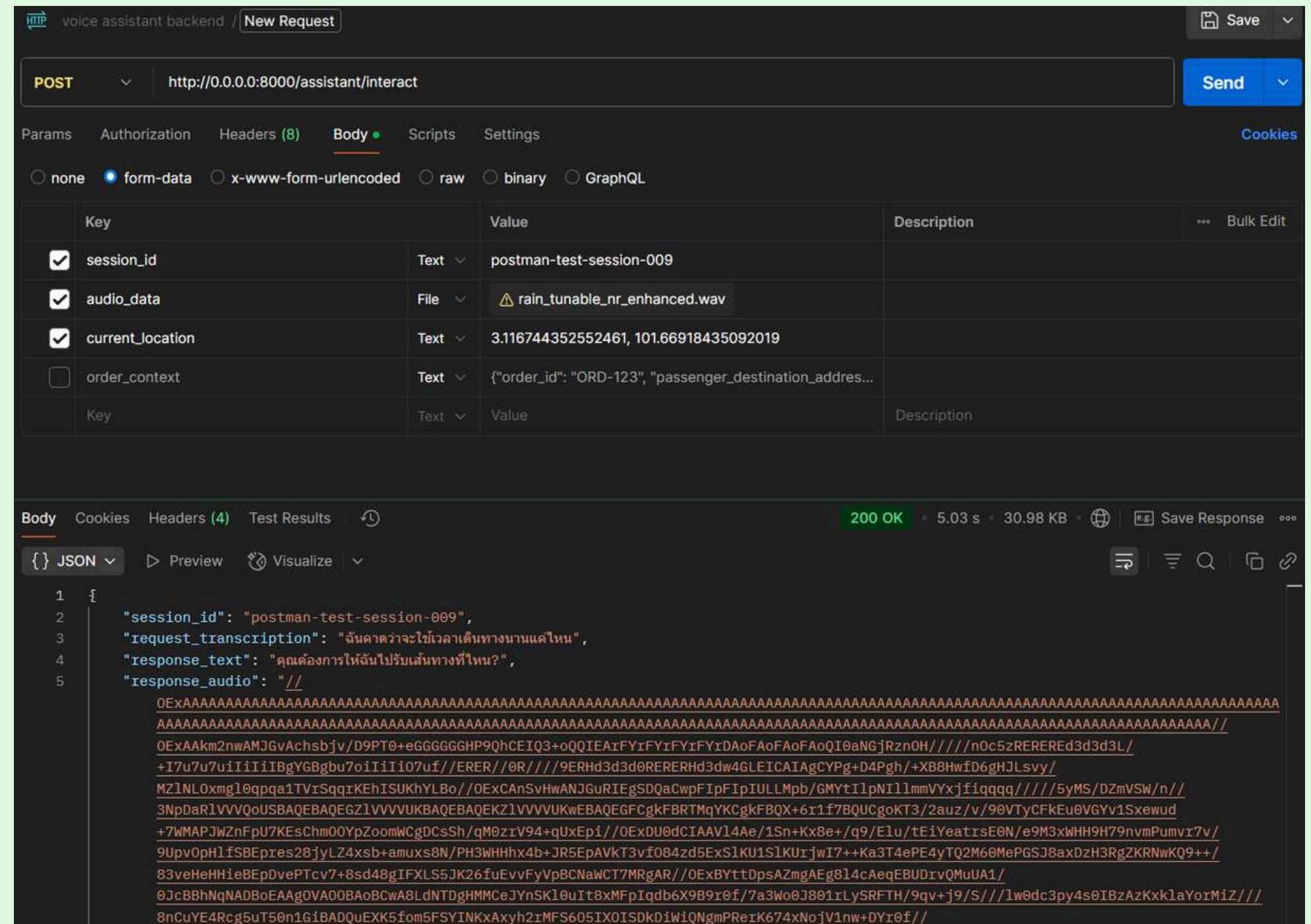
Transcript:

Input:

How long can I expect the journey to take?

Output:

Where do you want me to get directions to?



Noise Reduction

Vietnamese in Traffic Conditions

Input Audio



Output Audio



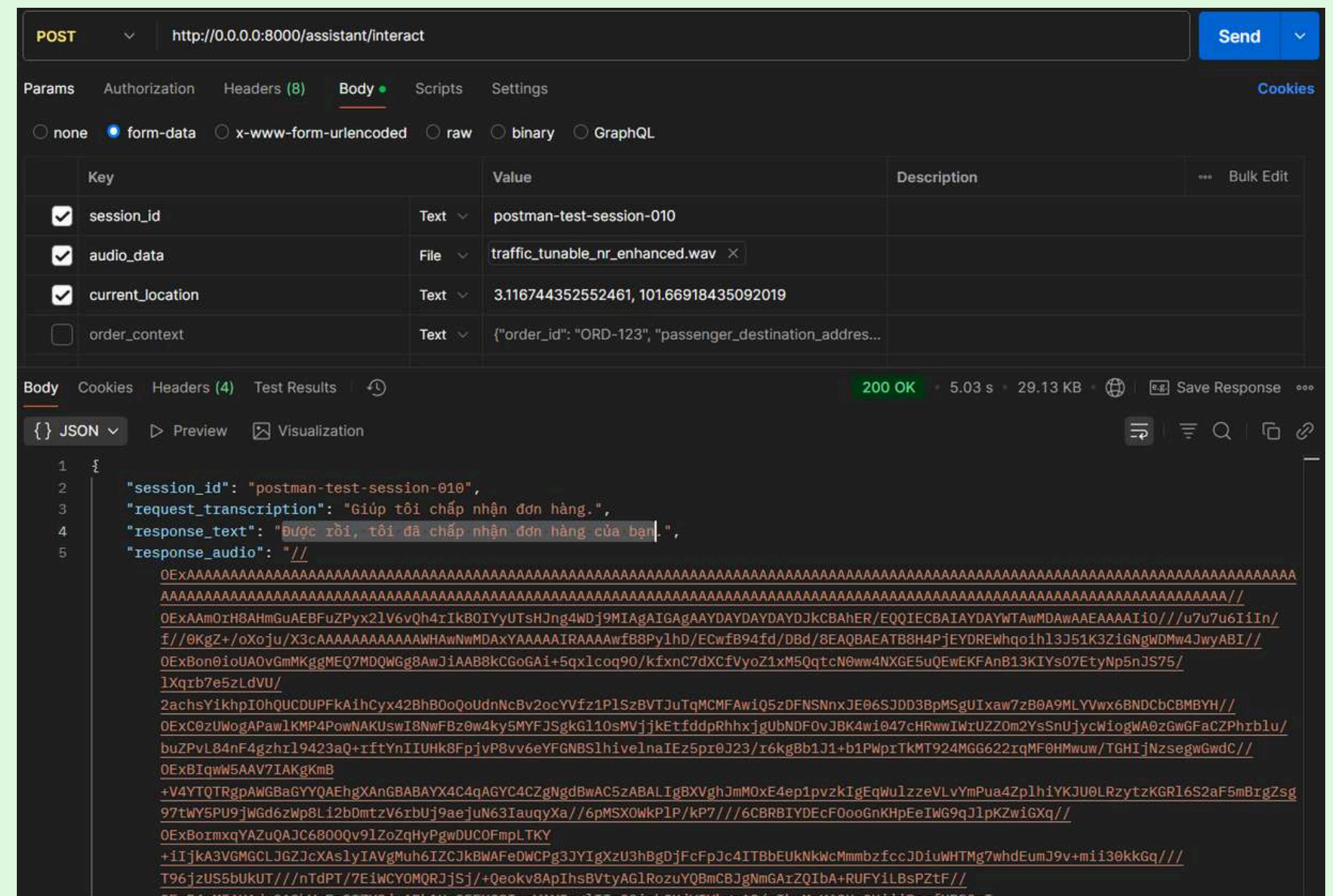
Transcript:

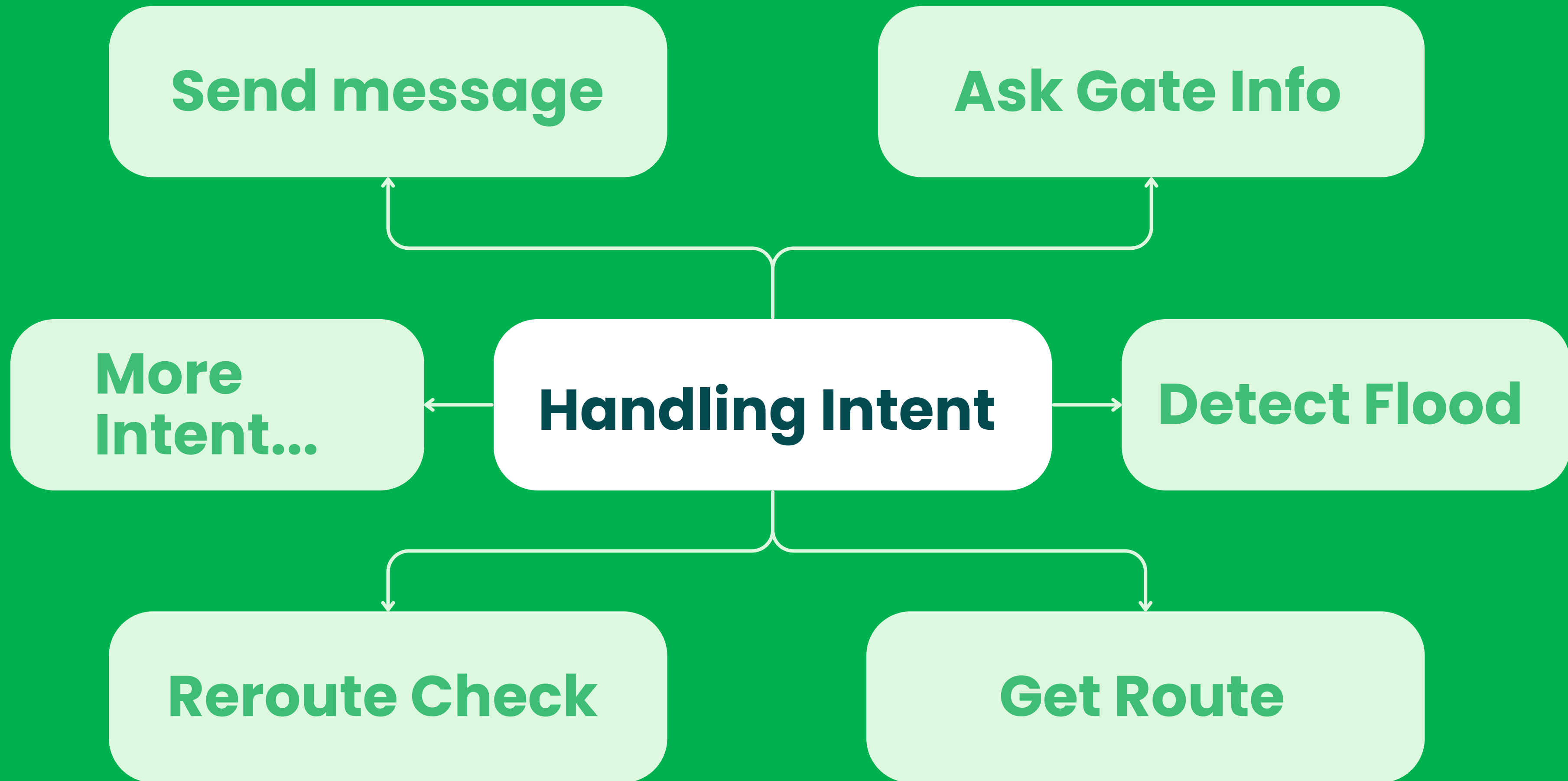
Input:

Help me accept orders.

Output:

Okay, I have accepted your orders.





Video Presentation Link

Your paragraph text

User Experience & Accessibility

Impact

Mobile App Compatible

Ensures wide usability on various mobile devices, especially for riders constantly on the move.

Full Conversational Flow (TTS + STT)

Enables hands-free operation, making the app safer and more usable during rides.

Adapt to Diverse Southeast Asia Language

Broadens reach across multilingual rider base, increasing adoption and comfort.

Translation & Response in Spoken Language

Helps riders who are not fluent in English, and increases understanding and task clarity.



Audio Performance

Noise Cancellation & Partial Audio Clarity

Improves voice recognition in noisy streets or traffic environments.

Enhance Voice Recognition Techniques

Boosts system accuracy, especially important in varied accents and dialects.

Adaptable to Various Environmental Conditions

Ensures reliable performance across weather, noise, and riding conditions.

Smart Assistant & Interaction Layer

NLU & Intent Handling

Powers smart understanding of voice commands and context.

Message Sending & Chat History

Enables safer rider-customer communication.

Crash, Yawn, Drowsiness Detection

Adds a safety net by identifying risks and improving rider wellbeing.

Navigation & Delivery Operations

Map Display, Route Display & Rerouting

Enhances navigation clarity, reduces delays.

Ride Acceptance Workflow & Step-by-Step Display

Smooths the order process, reduces rider confusion.

Customer/Destination Coordinate Fetching

Improves delivery accuracy and speed.

Ask Gate Info, Flood Check, Reroute Check

Context-aware help to avoid delays and deliver efficiently.



Future Implementation

- Real Communication Service using Twilio
- More consistent and Persistent Chat History by Integrating Databases
- Wake Word System – “Hey Grab”
Picovoice Porcupine
- Multiagent System (MAS) for Scalability
- Microservice to Improve Performance
- Security by Recognizing the Voice of User
 - Only the driver or rider can activate the chatbot



Conclusion

Our project successfully addresses the challenges faced by Grab drivers by delivering a voice-powered assistant that works seamlessly in noisy environments, understands diverse speech patterns, and provides hands-free support to enhance safety and efficiency on the road.

