A Customer Support Bot for the Airline Industry

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Problem Statement

- The objective is to design an intelligent system that automatically handles airline customer requests such as checking flight status, canceling trips, verifying policies, and answering travel rule inquiries.
- Each request type follows a predefined sequence of tasks — collecting flight details, interacting with airline APIs for real-time data, and retrieving relevant policy information.
- The system should interpret customer messages, identify the correct request type, execute the required tasks, and deliver accurate, timely responses to streamline interactions and reduce manual effort.

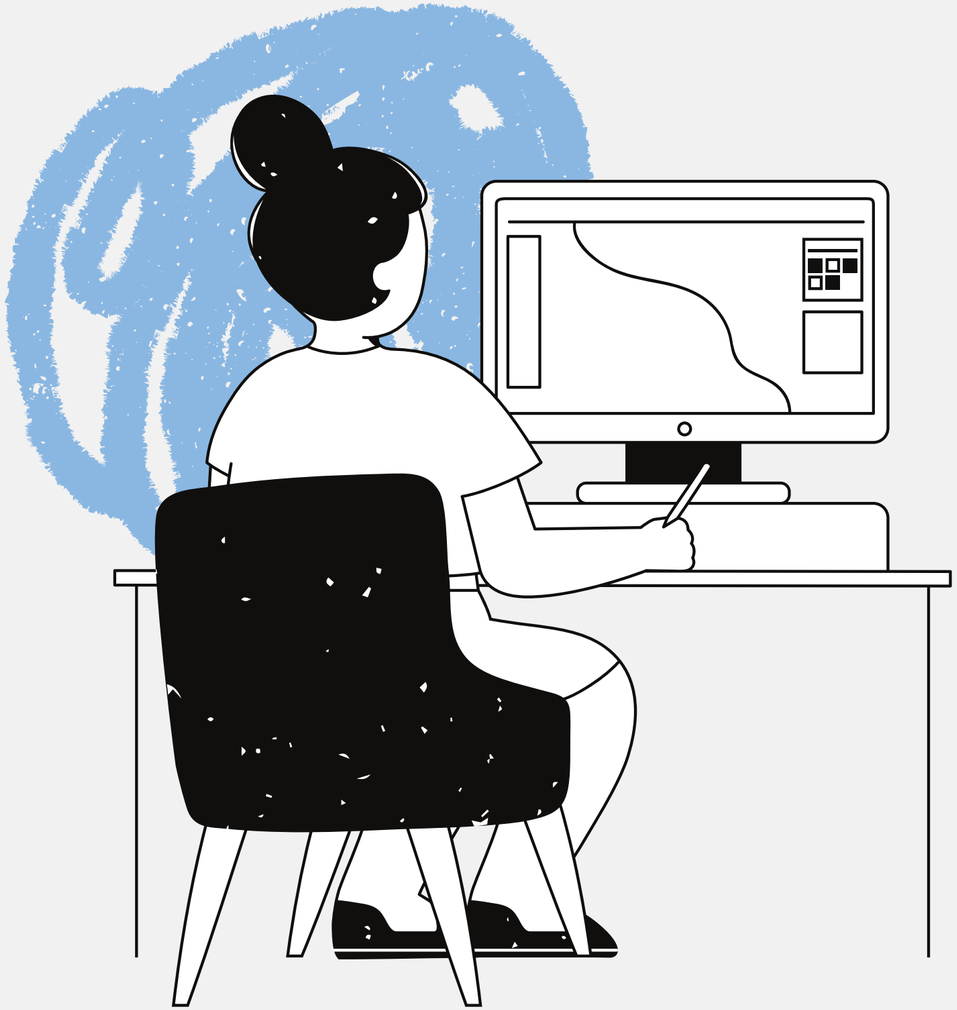
Objective

- Build a smart, automated support system for airlines
- Integrate AI intent understanding + workflow execution
- Provide:

1. Fast, accurate request handling
2. Low-latency backend
3. Easy scalability for new features

Proposed Solution Overview

- **Customer message** → Gemini API → Request Type
- **Node.js backend** orchestrates tasks
- **React frontend** provides a simple interface
- **Mock airline APIs** handle booking, cancel, seat info
- Returns **JSON response / UI update** instantly



Key Features

01. AI-powered request understanding (Gemini API)

02. Automated workflows for multiple airline services

03. Real-time API integration

04. Interactive Frontend (React UI)

05. Modular & scalable architecture

06. Logging + feedback mechanism

System Architecture

01. Frontend (React) – user input + response display

02. AI Layer (Gemini API) – intent classification

03. Backend (Node.js/Express) – orchestrates workflows

04. Integration Layer – connects to airline APIs

05. Data & Logging Layer – stores mock data + logs

Workflow

- User types “Cancel my flight AB1234”
- Gemini API → returns Cancel Trip intent
- Node backend → executes Cancel Trip workflow
- Calls mock /flight/booking and /flight/cancel APIs
- Returns JSON response → React UI displays confirmation

Module Description

Intent Service

Uses Gemini API to classify requests

Workflow Engine

Handles different airline workflows

API Handler

Connects to mock airline APIs

Response Builder

Formats structured JSON responses

Logger Module

Records latency and feedback

Example Use Case 1: Cancel Trip

Input: “Cancel my flight PNR AB1234”
Process:

- Gemini API → returns Cancel Trip
- Node backend calls /flight/booking
- Cancels flight via /flight/cancel
- Generates refund response

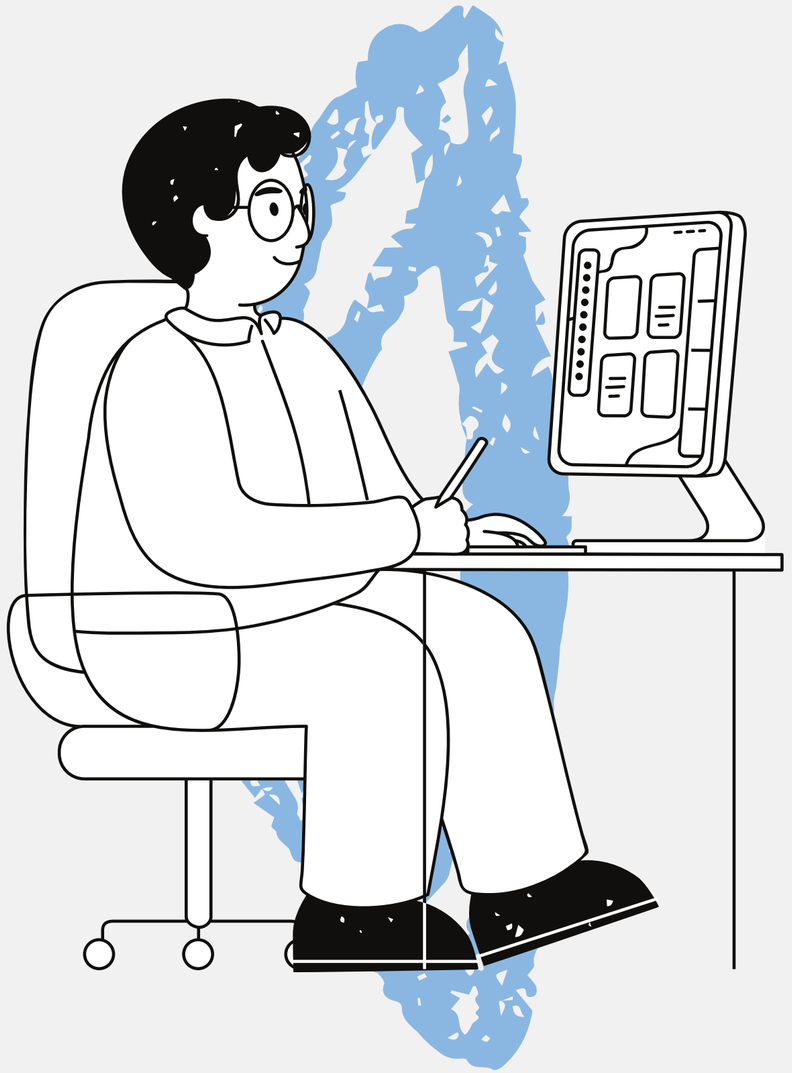
Output:

{
"**message**": "Flight Cancelled",
"**refund_amount**": 1850,
"**refund_date**": "2025-10-25"
}

Example Use Case 2: Seat Availability

Input: “Show me available seats for AB1234”
Process:

1. Gemini → intent: Seat Availability
2. Backend → calls /flight/available_seats
3. Returns seat map & prices
4. Output: Seat layout displayed on React UI



Challenges:

- Integrating Gemini API securely
- Handling API errors and timeouts
- Keeping latency low on free tier

Future Enhancements:

- Add voice input & multilingual support
- Integrate real airline data APIs
- Use vector DB for policy search
- Deploy on cloud with monitoring

Conclusion

- Built a complete AI-driven customer support workflow
- Achieved real-time automation of airline requests
- Extensible for real enterprise adoption
- Demonstrates integration of AI + Backend + Frontend

Thank You