



RESEARCH PROJECT

AI Chatbot Development using Google Gemini AI

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GET STARTED

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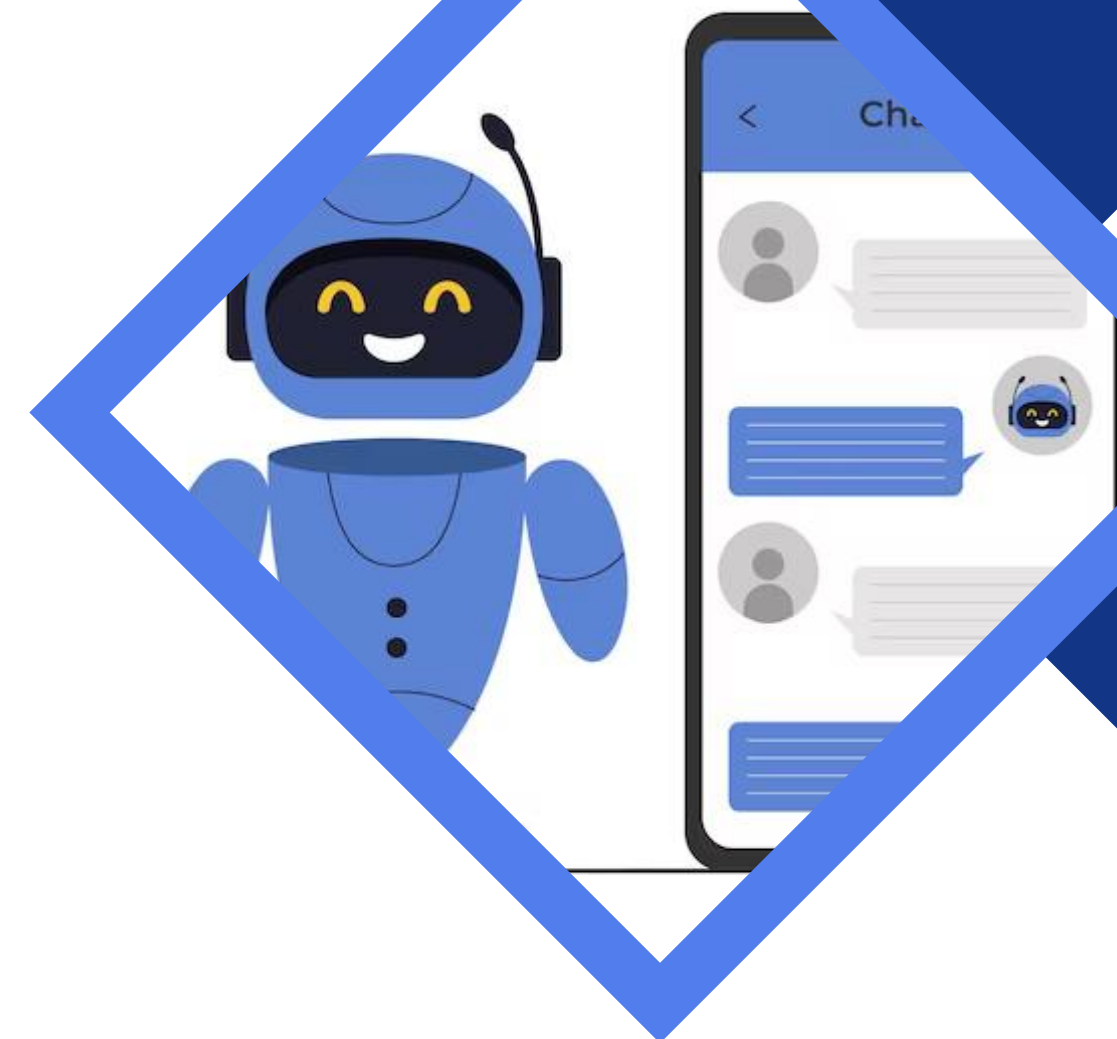
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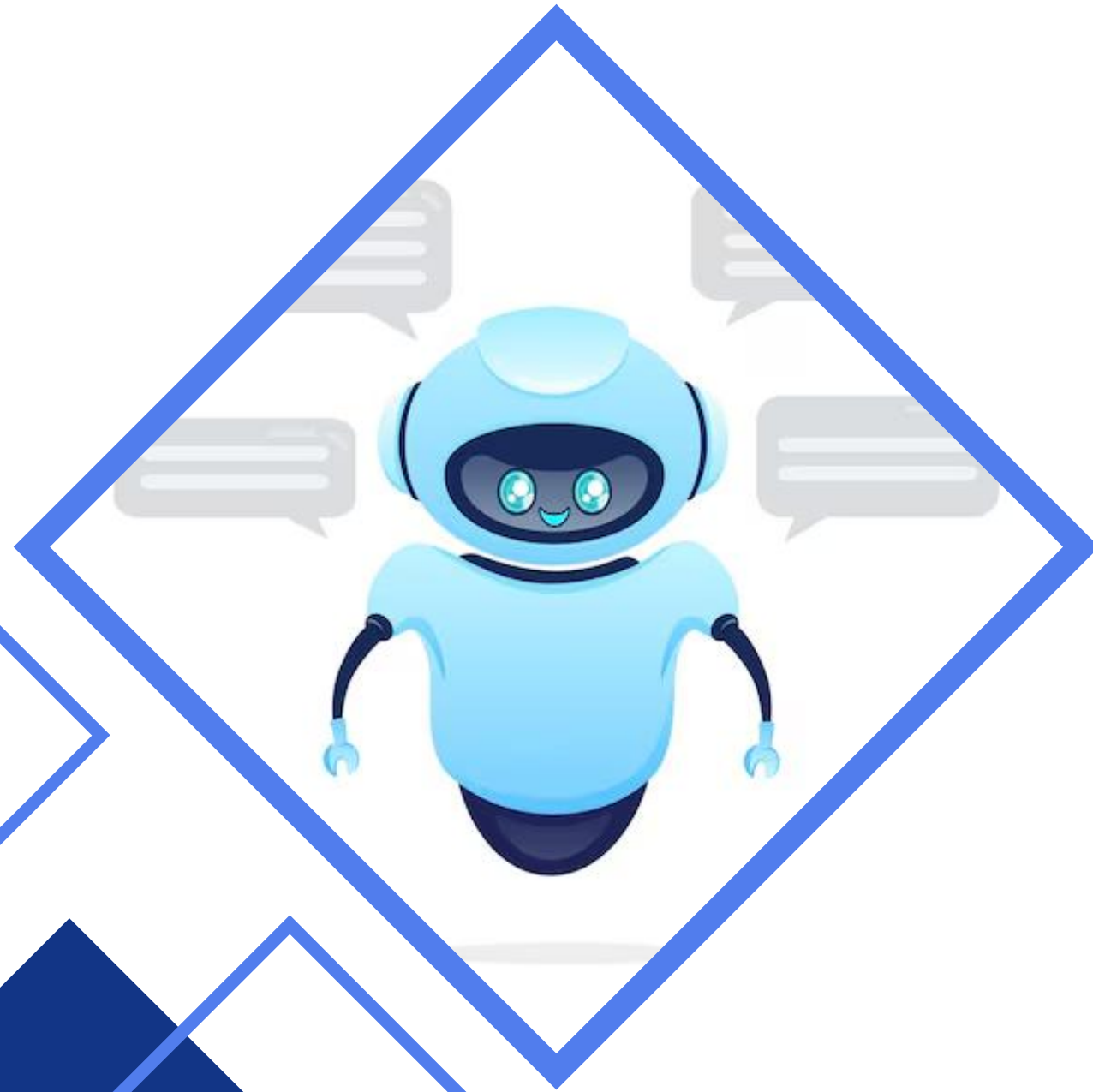
Introduction

- SmartTalk-AI is an innovative web application designed to enhance human-AI interaction through natural, multimodal communication.
- Built with React.js and powered by Google's Gemini API, it enables users to engage in real-time conversations, analyze images, and get coding support.
- The app also integrates live weather updates and news feeds, making it a smart, all-in-one assistant for productivity and information.



Technology Stack

Category	Technology
Frontend	React.js
Backend	Node.js + Express
Database	MongoDB Atlas
AI Integration	Google Gemini 1.5 Flash API
Image Handling	ImageKit
Authentication	Clerk
APIs	OpenWeather API, News API

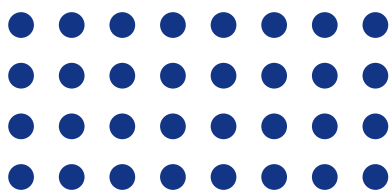


Problem Statement

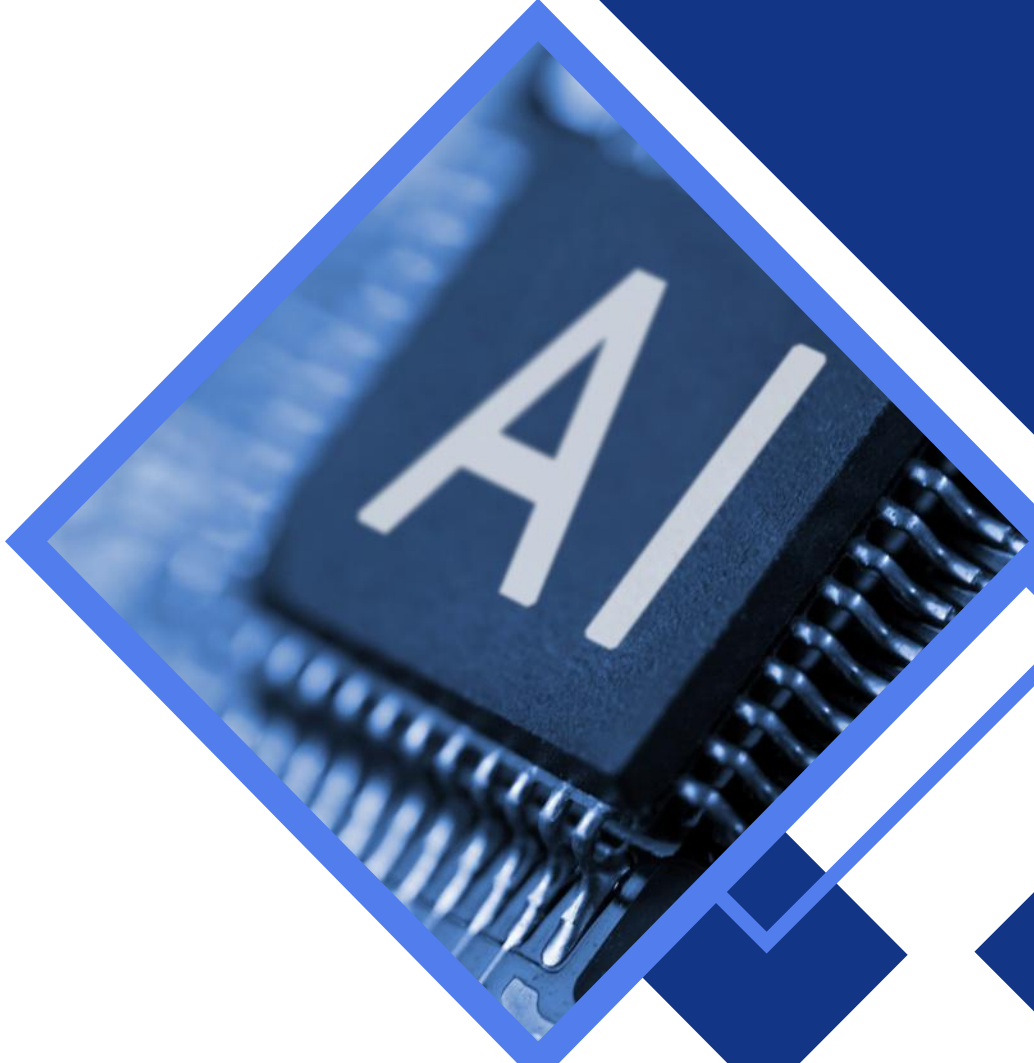
Traditional chatbots suffer from several key limitations:

- Outdated or static information, lacking real-time updates
- No access to live news or external data sources
- Limited data retrieval capabilities, reducing relevance and accuracy
- Lack of multimodal support (e.g., no image handling)
- Weak security due to absence of proper authentication mechanisms

Why Gemini 1.5 Flash

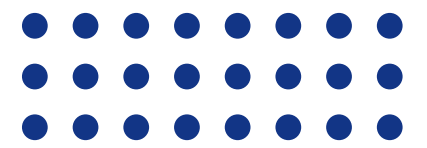


Feature	Gemini 1.5 Flash	GPT-4(Turbo)
Response Speed	Ultra-fast, real-time streaming	Fast, but slightly delayed
Multimodal Support	Native text + image input	Yes, but images handled separately
Streaming Capability	Smooth, low-latency responses	Available, may lag in long chats
Integration Simplicity	Lightweight, easy web SDK	Requires more backend setup
Cost Efficiency	Lower token cost (API usage)	Higher cost in GPT-4 tier



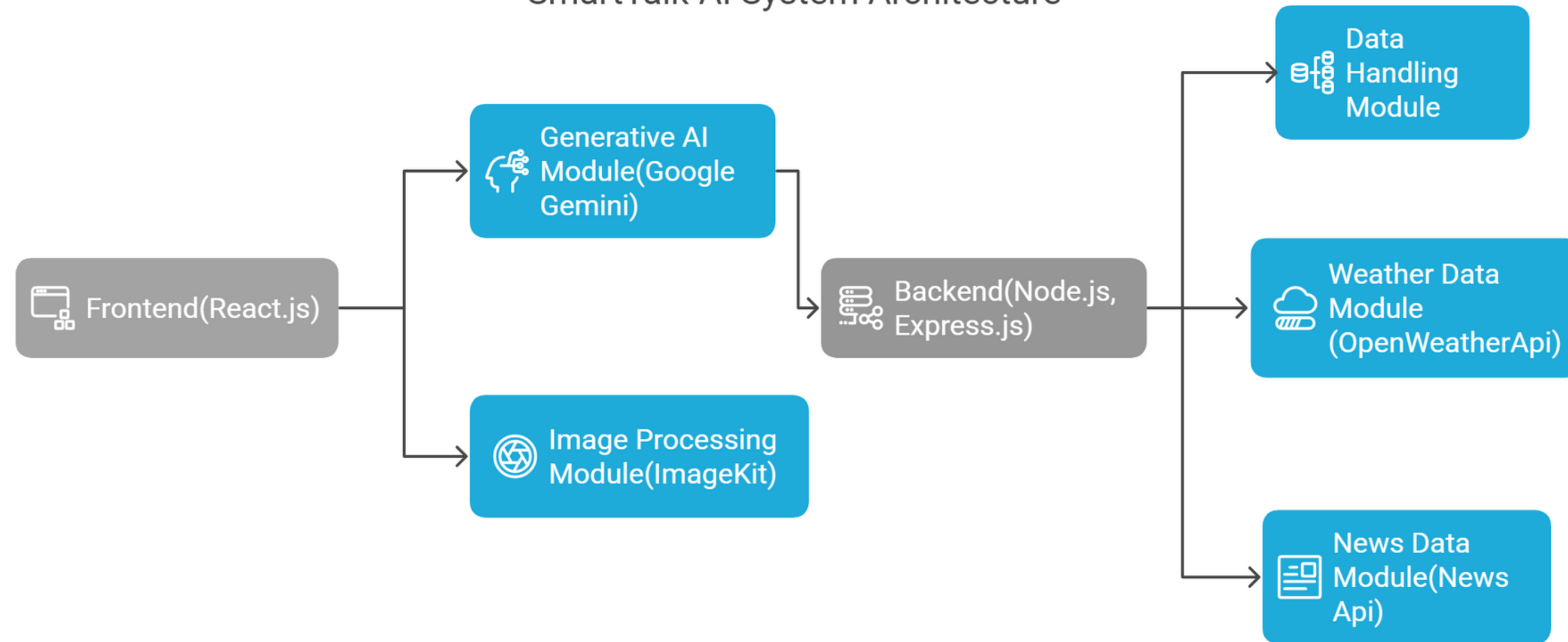
Project Features

1. AI-Powered Conversations
2. Multimodal Interaction
3. Live Weather & News Updates
4. Secure Authentication
5. Chat History Storage
6. Dynamic UI



System Architecture

SmartTalk-AI System Architecture

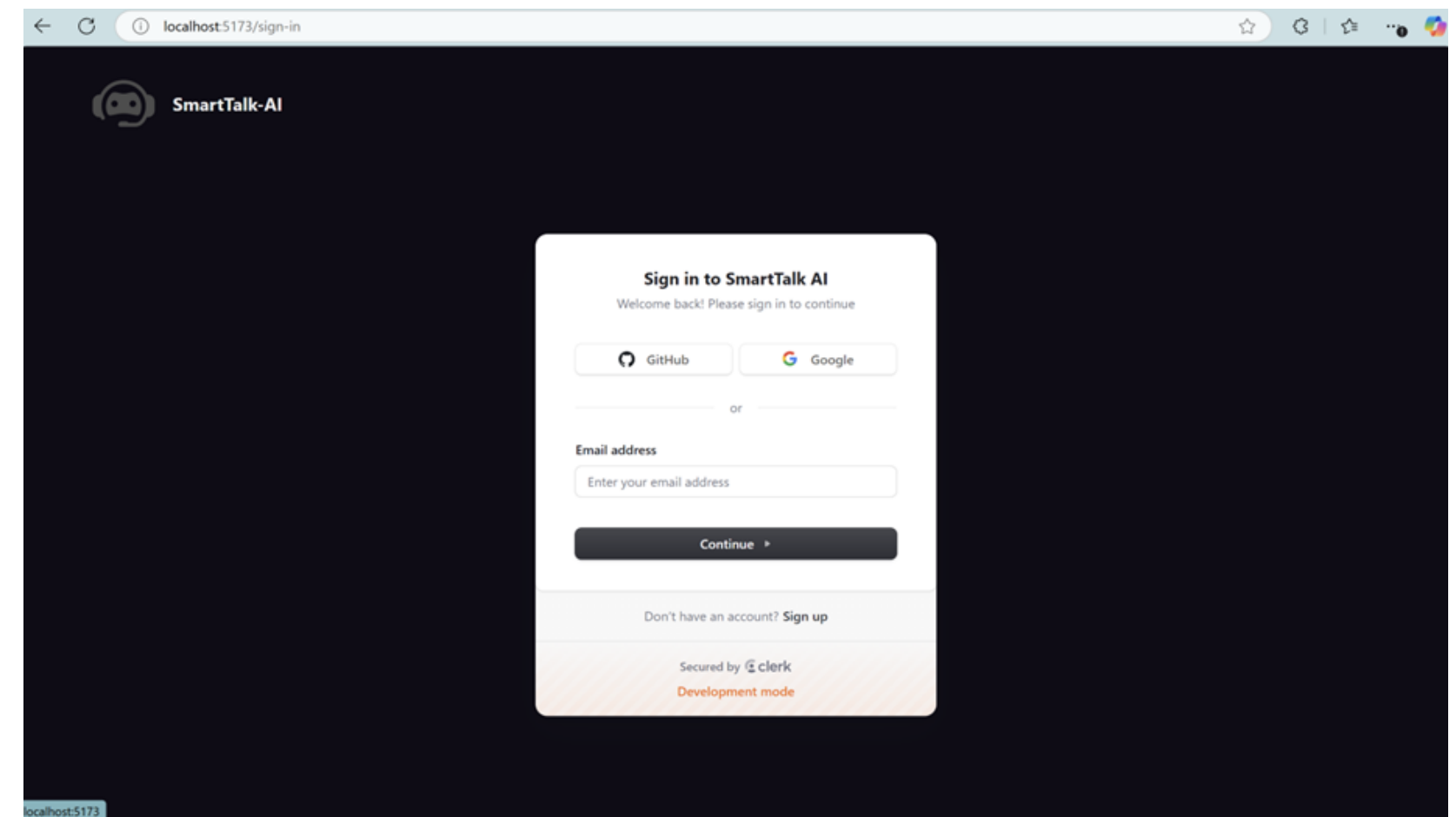
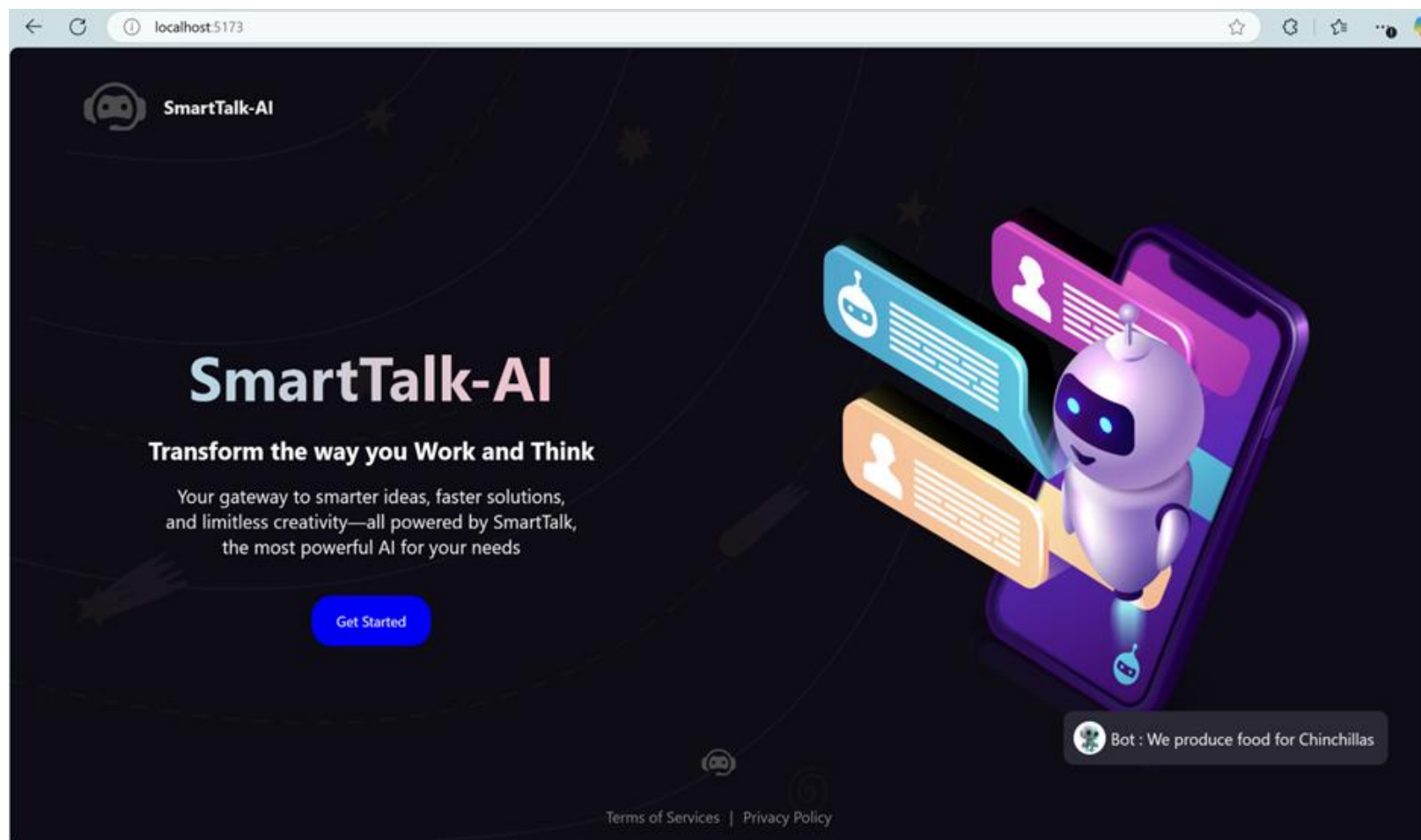


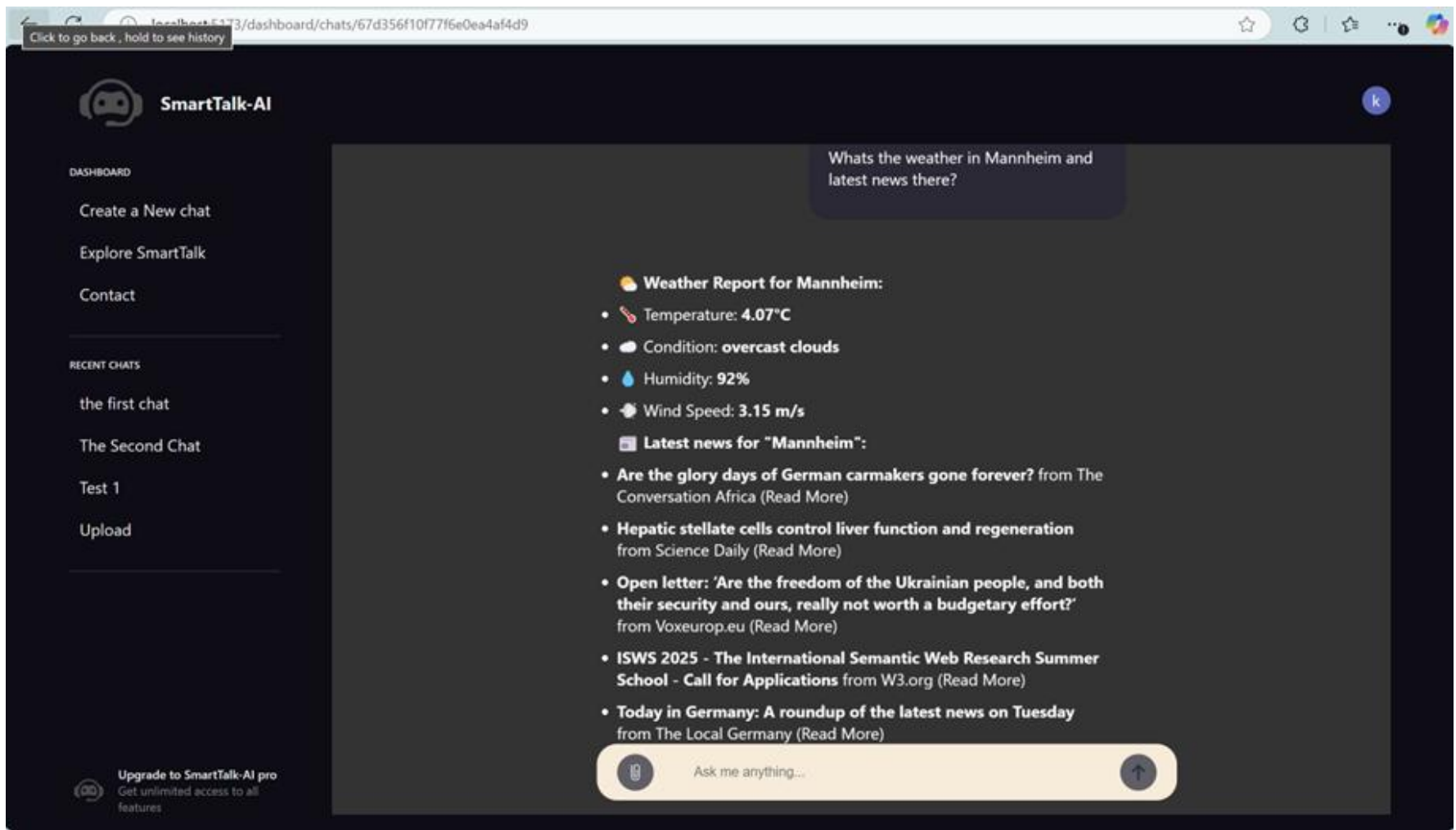
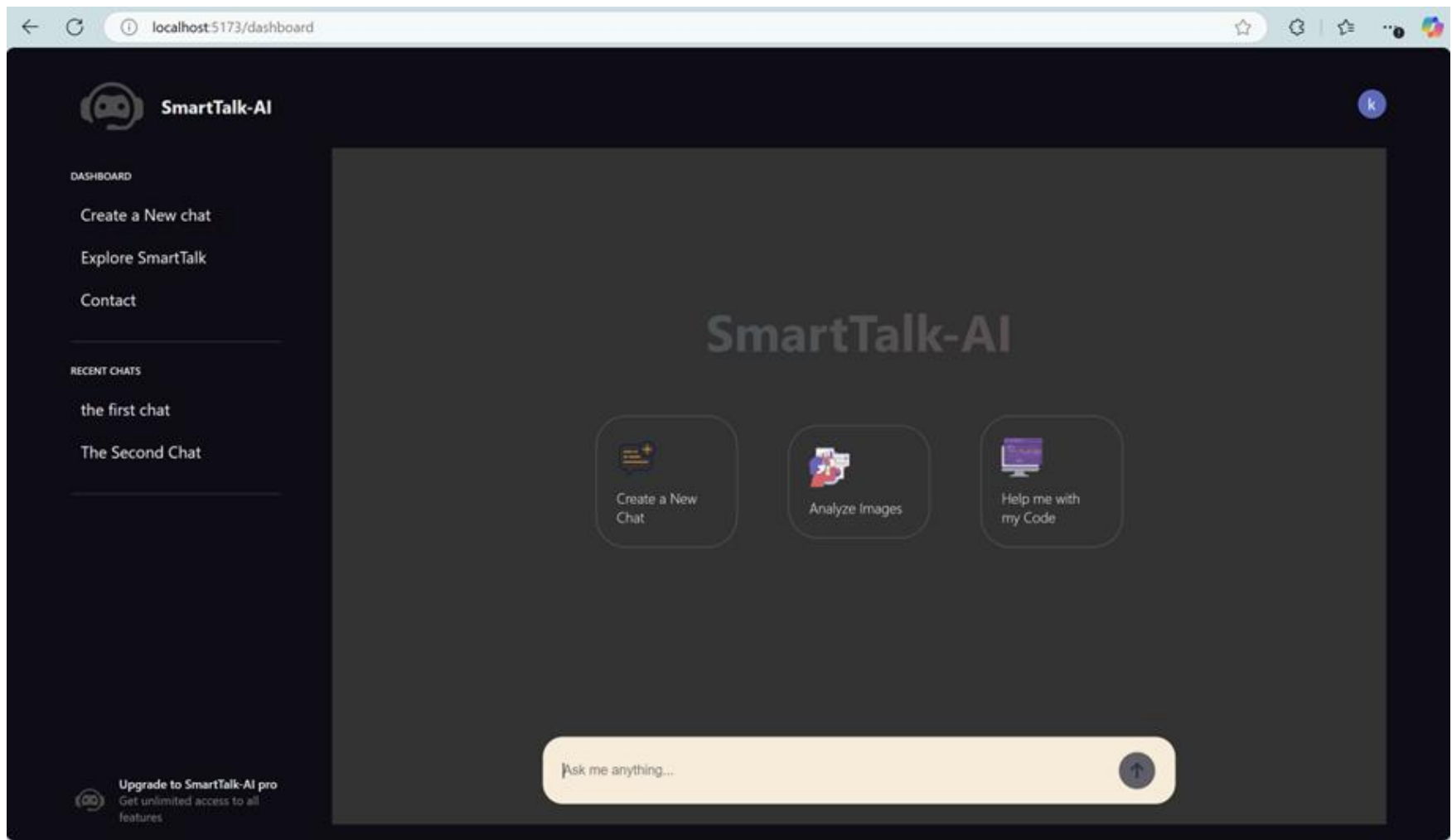
APIs and AI Integration

- ✓ Google Gemini Flash 1.5 API
- ✓ OpenWeather API
- ✓ News API
- ✓ ImageKit API
- ✓ Custom REST APIs (Node.js + Express.js)



User Interface (UI) Walkthrough





Research Questions

1. How can AI-powered chat applications improve user experience through real-time, multimodal interaction and live data integration?
2. Can a single AI-powered application effectively combine chat, image recognition, weather updates, news feeds, and code assistance to streamline user interactions?

Challenges Faced

Real-Time AI Response Handling

Managing streamed responses from the Gemini API without delays or UI glitches.

API Key Management & Security

Protecting sensitive keys (.env) while ensuring smooth local and production deployments.

User Authentication Integration

Configuring Clerk to handle redirects, session validation, and route protection correctly.

Data Sync with MongoDB Atlas

Ensuring consistent chat history updates and handling asynchronous data mutations.



Future Scope

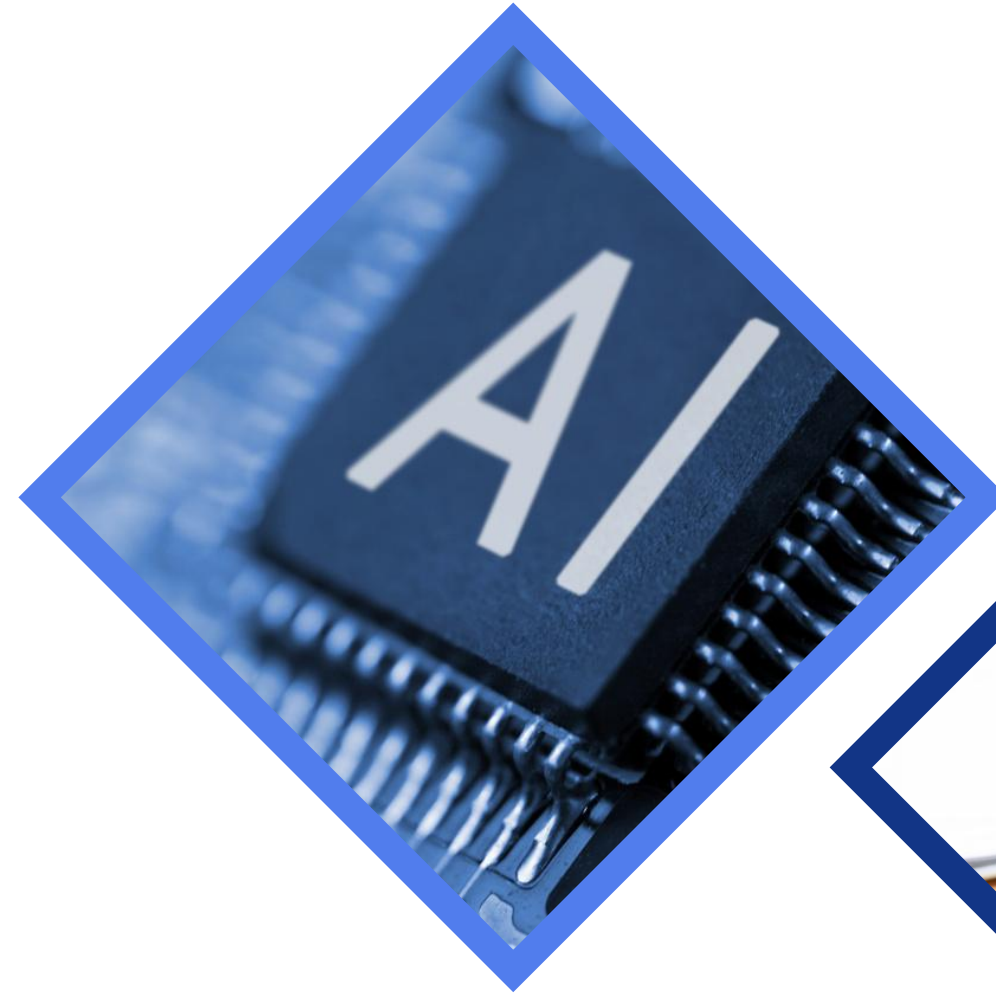
Voice Input & Text-to-Speech Integration

Document Upload

Pro Version / Subscription Tier

Mobile App Development





LIVE DEMO



SmartTalk-AI

Thank You

Thank You For your Time and attention!
I hope you found this presentation insightful and engaging.

“Innovation is not about ideas — it's about making ideas
happen.”

