AI Live Meeting Summarizer

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Project Overview

A comprehensive end-to-end solution that transforms meeting audio into actionable summaries with seamless export and delivery options.

Audio Capture

Live recording and file upload support for flexible input methods

Smart Processing

TF-IDF extractive summarization for key insights extraction

Export Options

PDF, Markdown, and TXT formats for versatile distribution

Delivery System

Automated email delivery with comprehensive session logging

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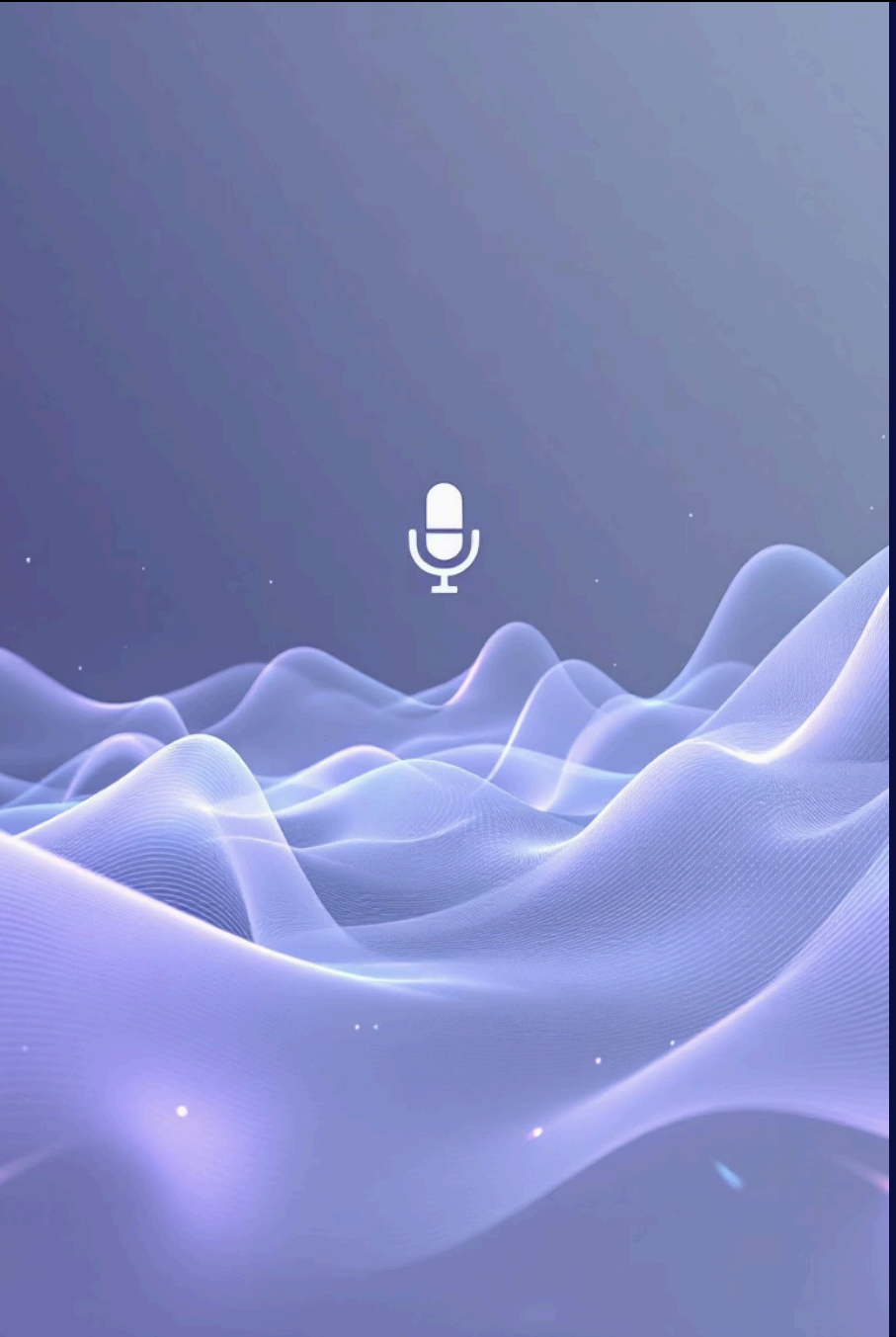

Milestone 1 – Speech-to-Text

The foundation of our system: converting spoken words into accurate, machine-readable text using industry-standard recognition technology.

01

Google SpeechRecognition Integration

Implemented robust speech recognition engine with high accuracy rates

02

Dual Input Support

WAV file upload and real-time microphone recording capabilities

03

Quality Assurance

Target Word Error Rate (WER) below 15% through audio preprocessing

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Milestone 2 – Summarization

Intelligent Content Extraction

Leveraging TF-IDF (Term Frequency-Inverse Document Frequency) methodology to identify and extract the most relevant information from transcribed content.

Key Performance Metrics

- ROUGE score target exceeding 0.40 for summary quality
- Extractive approach preserves original phrasing
- Clean, structured output with logical flow
- Automatic key point identification

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Milestone 3 – UI Integration

Designing an intuitive, professional interface that makes meeting summarization accessible to all users, regardless of technical expertise.

Streamlit Framework

Built on modern, responsive web framework for seamless user experience

Flexible Workflow

Choose between live recording or file upload based on user needs

Professional Design

Modern blue theme with clean typography and intuitive navigation

Real-Time Display

Instant transcription and summary visualization upon processing

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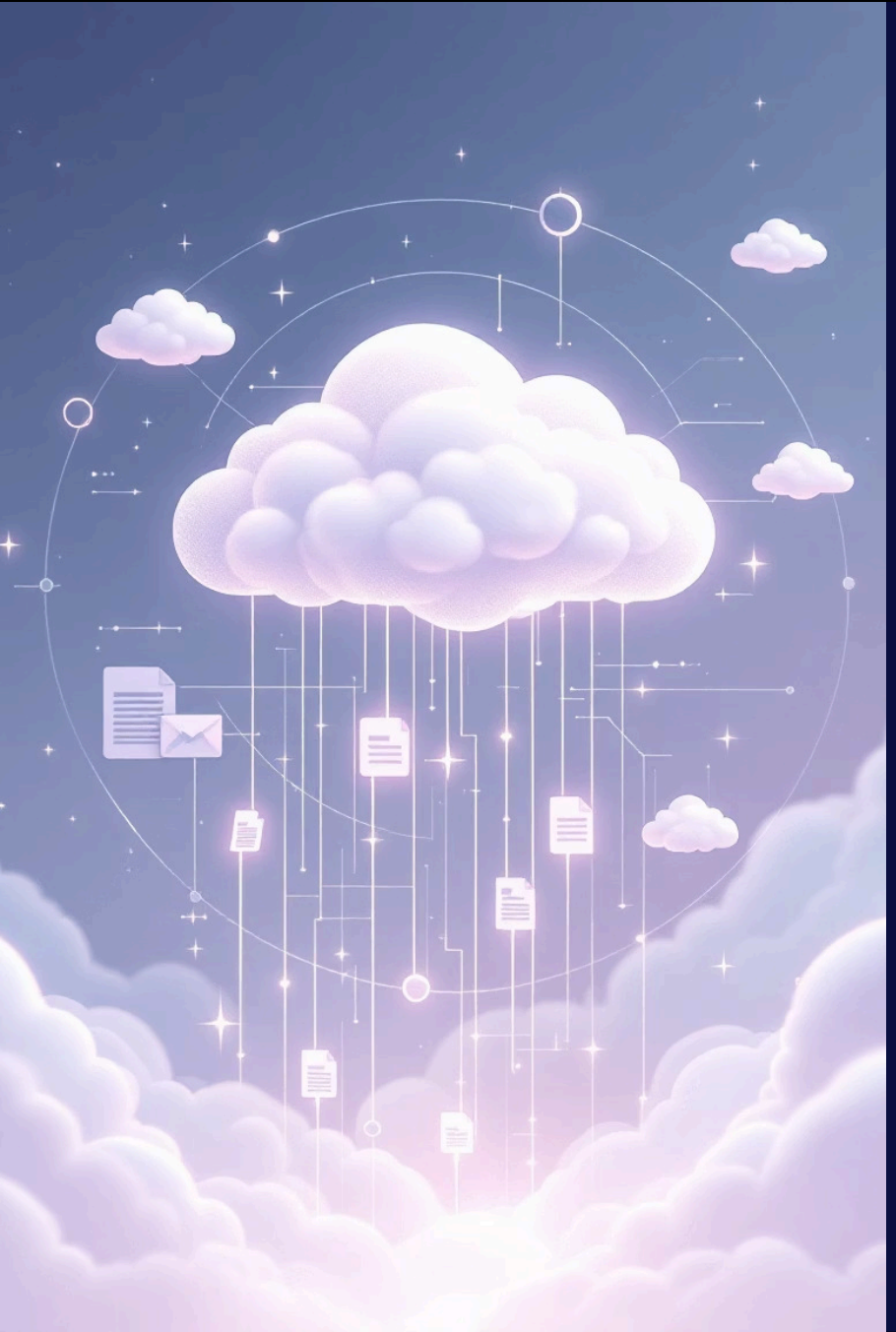

Milestone 4 – Final Delivery

Completing the ecosystem with comprehensive export capabilities, automated distribution, and session tracking for enterprise-grade functionality.

Export Capabilities

- **PDF format:** Professional documents with formatted layout
- **Markdown:** Developer-friendly plain text with structure
- **TXT files:** Universal compatibility for any system

Delivery & Tracking

- **SMTP email:** Automated delivery to stakeholders
- **Session logging:** JSON and CSV format tracking
- **Full integration:** All components working seamlessly

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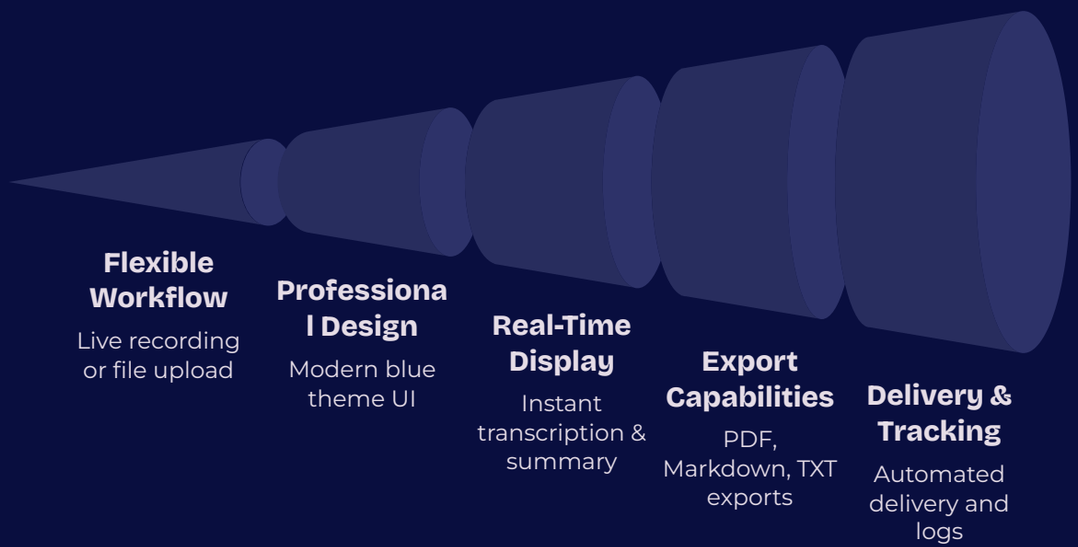
System Architecture

A modular, scalable design that ensures reliability and maintainability across all components of the meeting summarization pipeline.



Audio Input

File upload or live recording

STT Engine

Speech recognition processing

TF-IDF Summarizer

Intelligent content extraction

Export System

Multi-format generation

Email & Logging

Delivery and tracking

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Tools & Technologies Used

- **Python**

Used as the primary programming language for backend logic, audio processing, summarization, and handling exports/emails.

- **Streamlit**

Modern UI framework used to build the web interface for recording audio, uploading files, displaying transcription & summary.

- **SpeechRecognition (Google Web Speech API)**

Used for converting speech→text from WAV recordings or uploads. No API key required.

- **sounddevice**

Used to record live microphone audio in real time and save it as `.wav`.

- **NumPy**

Used for numerical operations, helping with text processing and TF-IDF matrix calculations.

- **scikit-learn (TF-IDF Vectorizer)**

Implemented extractive summarization using sentence ranking based on importance scores.

- **fpdf2**

Used to export summaries and transcripts as downloadable **PDF files** with Unicode-safe fonts.

- **SMTP (smtplib + Gmail App Password)**

Email system used to send summaries with PDF/MD/TXT attachments directly from the app.

- **JSON / CSV Logging**

Session-based logging system to store transcripts, summaries, timestamps, and metadata for future reference.

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Challenges & Learnings

Every innovative project faces obstacles. Here's how we overcame technical hurdles to deliver a production-ready solution.

SMTP Authentication

Navigated complex email security protocols and app-specific password requirements for reliable delivery

Unicode PDF Handling

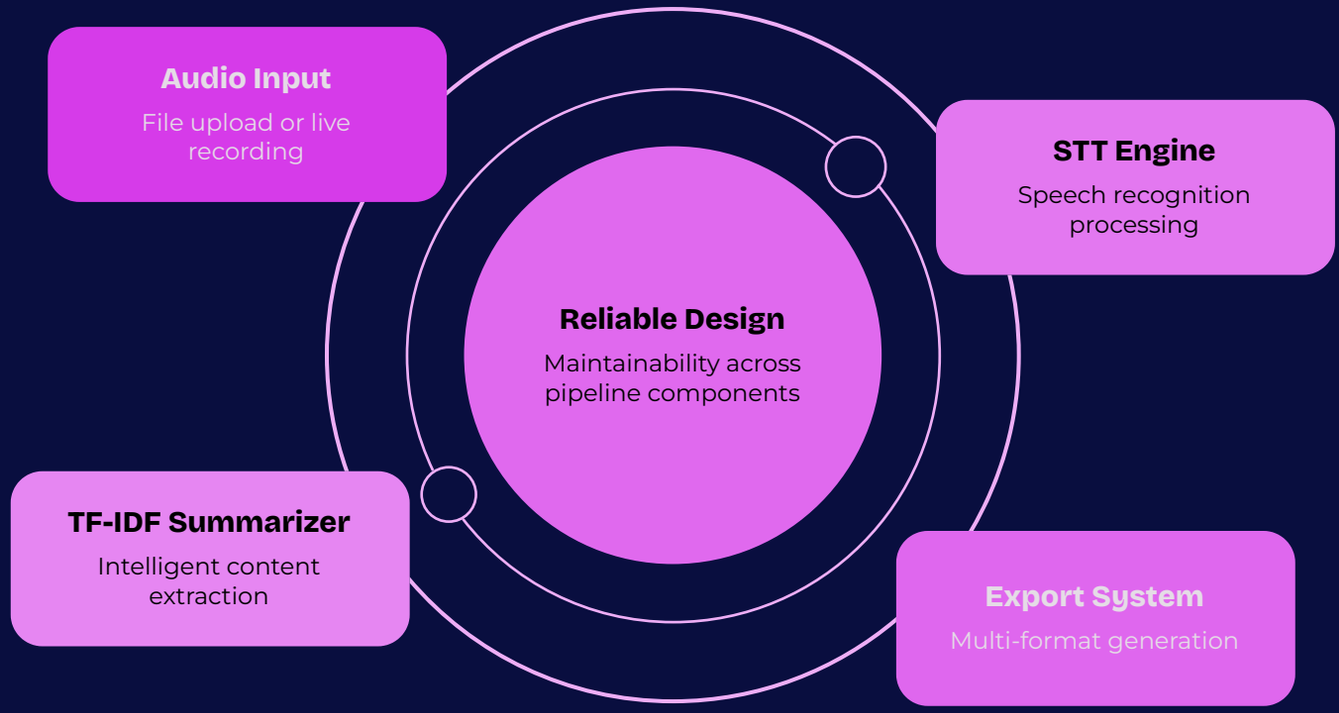
Resolved character encoding issues to support international characters and special symbols in exports

Audio Quality Variations

Implemented preprocessing pipeline to handle diverse audio sources and background noise conditions

Streamlit State Management

Mastered session state handling to maintain data consistency across user interactions



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Future Scope

The roadmap ahead: expanding capabilities and preparing for real-world deployment at scale.

Offline STT with Vosk/Whisper

Enable processing without internet dependency for privacy-sensitive environments

Speaker Diarization

Identify and label individual speakers for multi-participant meeting clarity

Multilingual Support

Expand to support transcription and summarization in multiple languages

Cloud Deployment

Scale infrastructure for enterprise use with containerization and cloud hosting

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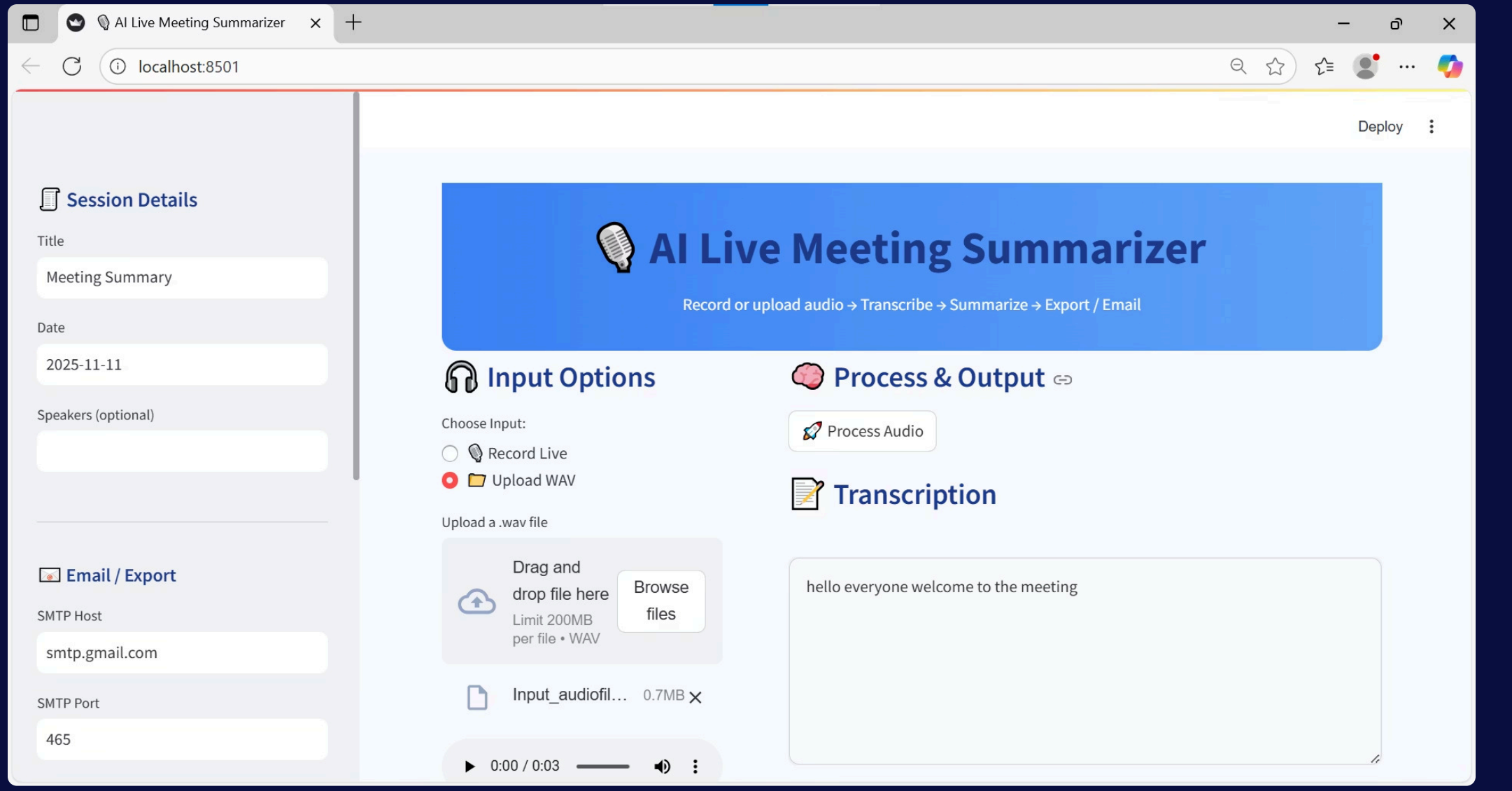

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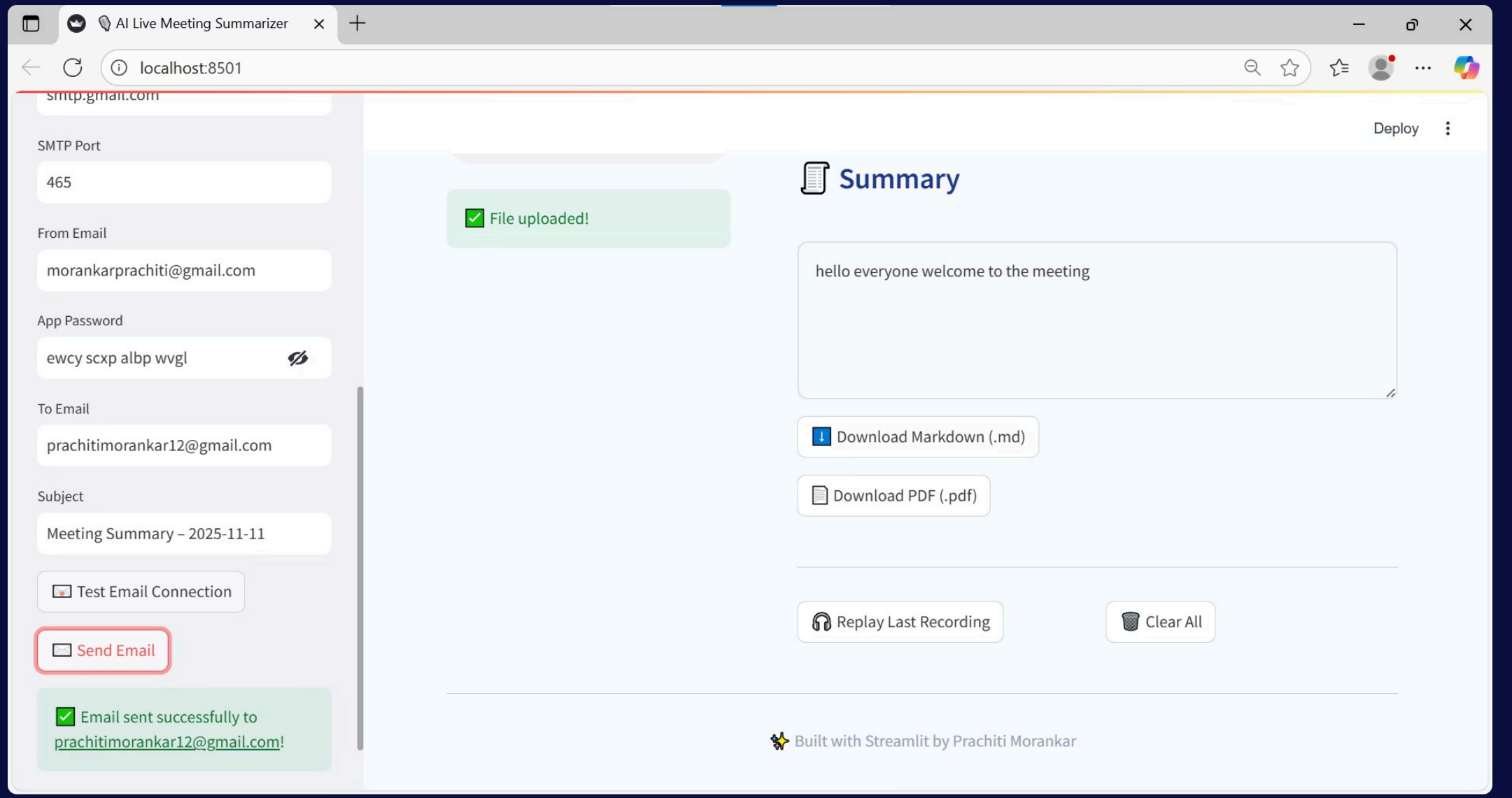

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Conclusion

Mission Accomplished

- **All Four Milestones Completed**

  Delivered on schedule with all requirements met

- **Fully Functional Meeting Assistant**

  End-to-end pipeline from audio to actionable summaries

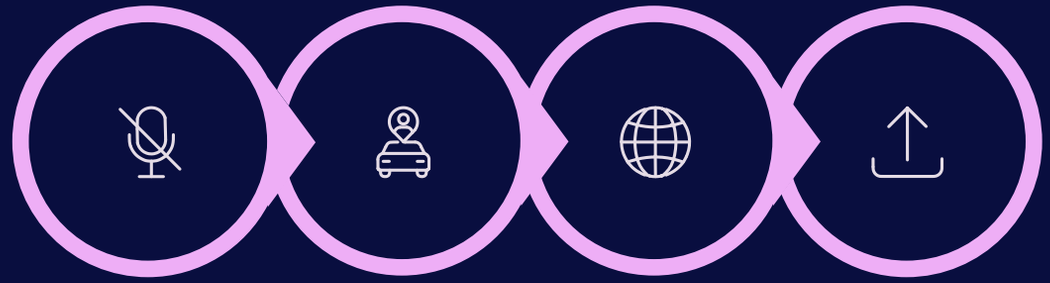
- **Professional Export & Delivery**

  Multiple formats with automated email distribution

- **Demo-Ready Application**

  Polished UI ready for stakeholder presentation

Thank you for your attention. Ready for questions and demonstration.



Offline STT | **Speaker Diarization** | **Multilingual Support** | **Cloud Deployment**

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