

Real-Time AI Sales Intelligence and Sentiment-Driven Deal Negotiation Assistant

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Project Documentation

1. Planning

Project Overview

The project aims to transform the sales process by developing an AI-powered assistant that provides real-time sentiment analysis, intent detection, personalized recommendations, and negotiation coaching. It reduces manual effort, improves customer engagement, and optimizes the sales workflow.

Goals and Objectives

- Provide real-time insights during customer interactions.
- Suggest personalized products based on customer needs.
- Enhance negotiation skills of sales representatives with AI-driven coaching.
- Automate post-call analysis to save time and reduce errors.

Problem Statement

- Lack of real-time insights during sales interactions.
- Generic product suggestions that do not cater to customer needs.
- Limited real-time coaching for handling objections and closing deals.
- Manual and error-prone post-call summaries.

Impact

- Reduced customer satisfaction.
- Lower conversion rates.
- Missed sales opportunities.

Scope

- **Target Audience:** Sales teams, customer support representatives, and sales managers.
- **Features:** Sentiment analysis, intent detection, product recommendations, negotiation coaching, and post-call summaries.
- **Constraints:** Low latency (<200ms) for real-time analysis and scalability for concurrent users.

Timeline

| Phase | Timeline | Deliverables |
|-----------------------|----------|----------------------------------|
| Planning | Week 1 | Requirement Analysis |
| Requirements Analysis | Week 2 | Features List, Use Cases |
| System Design | Week 3 | Architecture Diagrams, API Specs |
| Implementation | Week 4-5 | Frontend, Backend, Integrations |
| Testing | Week 6 | Test Cases, Reports |
| Deployment | Week 7 | Production-Ready System |

2. Requirements Analysis

Functional Requirements

1. Real-time speech-to-text conversion.
2. Sentiment analysis with classifications: Very Positive, Positive, Neutral, Negative, Very Negative.
3. Intent detection for actions like purchase decisions or comparative research.
4. Personalized product recommendations based on customer preferences.
5. Feedback collection using thumbs up/down mechanisms.
6. Automated post-call summaries and analytics.
7. Real-time negotiation coaching with actionable insights.
8. Integration with Google Sheets for seamless data logging and analysis.

Non-Functional Requirements

1. Latency below 200ms for real-time processing.
2. Scalability to support concurrent user interactions.
3. Secure communication and data storage.
4. Responsive and user-friendly interface design.

Use Cases

- **UC1:** A salesperson uses real-time sentiment analysis during a live call to adjust their approach.
- **UC2:** Post-call summaries provide actionable insights for follow-ups and performance improvement.
- **UC3:** Customers receive tailored product suggestions during the conversation based on input.

3. System Design

System Architecture

1. Frontend

- **Technologies:** HTML, CSS, JavaScript, Tailwind CSS.
- **Responsibilities:** User interface for sales representatives and real-time interaction display.

2. Backend

- **Technologies:** Python, FastAPI, Groq API, FAISS, gspread.
- **Responsibilities:** Sentiment and intent analysis, recommendation engine, data logging.

3. Data Storage

- **Platform:** Google Sheets for centralized, secure data storage and analysis.

Component Diagram

- **Sentiment Analysis & Intent Detection:** Real-time NLP-based classification and tracking.
- **Product Recommendation Engine:** Uses FAISS and metadata for quick, accurate retrieval.
- **Post-Call Insights Hub:** Summaries and performance metrics for review.
- **Feedback Module:** Refines recommendations through collected user feedback.

4. Implementation

Environment

Setup Frontend

1. Clone the repository and set up the environment.
2. Use Tailwind CSS for responsive and modern UI styling.
3. Serve the application locally using a web server.

Backend

1. Install dependencies:

```
pip install -r requirements.txt
```

2. Start the FastAPI server:

```
uvicorn app:app --reload
```

3. Verify API endpoints through Swagger UI at <http://localhost:8000/docs>.

Google Sheets Integration

1. Enable Google Sheets API in the Google Cloud Console.
2. Share the spreadsheet with the service account email from the credentials file.
3. Use `gspread` for seamless interaction with Sheets.

5. Testing

Testing Strategy

- **Unit Testing:** Validate individual modules, such as speech-to-text and sentiment analysis.
- **Integration Testing:** Test interaction between the backend and frontend.
- **System Testing:** Ensure proper end-to-end functionality.
- **Performance Testing:** Validate the system's responsiveness and scalability.

Sample Test Cases

| Test Case | Input | Expected Output |
|--------------------|--------------------------------|-----------------------------|
| Speech-to-Text | "Is this available in red?" | "Is this available in red?" |
| Sentiment Analysis | "This is exactly what I need!" | Very Positive |
| Intent Detection | "What are the best deals?" | Research-Stage |

6. Deployment

- Host static files on platforms like Netlify or Vercel.
- Implement monitoring tools such as Prometheus or Grafana for system performance and error tracking.

7. Maintenance

Plan

- Regularly update features and fix bugs based on user feedback.
- Optimize algorithms and backend for improved performance.
- Monitor system uptime and reliability continuously.
- Add new functionalities, such as multi-language support and advanced analytics dashboards.

Conclusion

The Real-Time AI Sales Intelligence and Sentiment-Driven Deal Negotiation Assistant offers a comprehensive solution to modernize sales processes. By leveraging real-time sentiment and intent analysis, personalized recommendations, and negotiation coaching, it enhances customer engagement and sales efficiency. Adherence to SDLC ensures a robust, scalable, and user-friendly system that meets the needs of dynamic sales environments.