Support Call Analysis

Internship Interim Report II

Submitted To

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Introduction

Following the progress outlined in Interim Report I, this report details the work accomplished during Weeks 8 to 15 of the internship at Cuztomise Softech Pvt. Ltd. The primary objective during this phase was to enhance and finalize the Speech Recognition-based Support Call Analysis System. Focus areas included refining the transcription process using the Whisper model, improving data storage through SQL Server integration, building a user-friendly Flask-based dashboard, and implementing client-wise summary generation. Significant efforts were dedicated to optimizing audio preprocessing, handling edge cases, and enhancing user interface components for better usability. The system was further extended to support real-time status tracking, keyword-based analytics, and efficient retrieval of call data. This phase marked the transition from development to deployment readiness, ensuring the solution was robust, scalable, and ready for practical implementation in client environments.

Reporting Period

This report covers the progress made during weeks 8-15 of the internship. The work was structured into various phases, ensuring timely completion of milestones.

Accomplishments and Work Performed

Week 8: Bug Fixes and Backend Optimization

- Addressed minor bugs in the transcription output format (extra white spaces, punctuation errors).
- Implemented logging to track errors during Whisper model execution.
- Improved the API response format to return status codes and clear messages for each audio file.

Week 9: Integration of SQL Server and API Development

- Established a secure connection between the Flask app and SQL Server.
- Created API endpoints for inserting and retrieving transcription data using RESTful services.
- Added functionality to handle edge cases like duplicate file uploads or empty audio files.

Week 10: Frontend UI Enhancements using Flask and HTML/CSS

- Designed a clean web dashboard to visualize audio files, transcription output, and summary reports.
- Implemented filtering and search functionality based on client name, date, and keywords.
- Added table views for status tracking of each support call (transcribed, pending, error).

Week 11: Audio Preprocessing Improvements

- Added logic to trim silent segments from audio files before transcription.
- Normalized audio volume to enhance transcription accuracy.
- Improved error handling for corrupted or incompatible audio formats.

Week 12: Summary Generation and Keyword Analysis

- Integrated a summary generator to extract highlights from each transcription.
- Used keyword matching techniques to identify key concerns in support calls (e.g., "not working", "payment issue").
- Stored summaries in the database and linked them to respective clients in the dashboard.

Week 13: Dashboard Finalization and Client Analytics

- Finalized dashboard layout with client-wise summaries and audio file statistics.

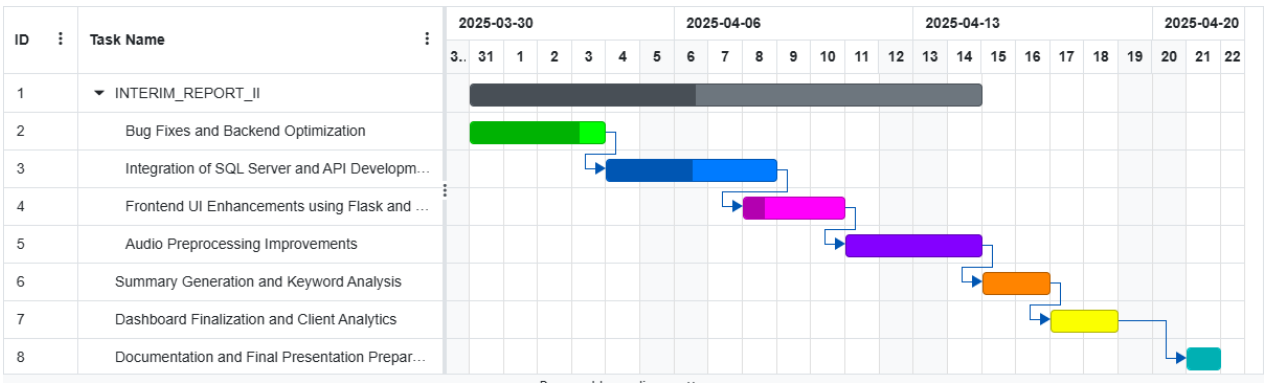
- Implemented visual indicators (color codes) for transcription status and error logs.
- Created a section for client insights showing recurring issues, call durations, and word frequency.

Week 14: Testing, Debugging, and Code Optimization

- Conducted end-to-end testing of the portal including file upload, transcription, database logging, and UI updates.
- Fixed UI responsiveness issues on smaller screens.
- Refactored code for better modularity and maintainability.

Week 15: Documentation and Final Presentation Preparation

- Documented the entire project structure including model usage, backend API structure, database schema, and frontend logic.
- Prepared the final presentation slides for showcasing project flow, features, and real-world impact.
- Collected feedback from mentors and incorporated final suggestions for improvement.



Academic Relevance

The second half of the internship provided a deeper practical application of concepts learned during my academic coursework, especially in areas such as machine learning, natural language processing, full-stack development, and database management systems. The integration of OpenAI's Whisper model into a real-world application reinforced my understanding of deep learning and audio signal processing, which were covered in courses on artificial intelligence and deep learning.

The design and development of the Flask-based web application aligned with concepts from web technologies and software engineering, while working with SQL Server and API integration reflected the principles of database systems and backend development. Additionally, knowledge from data structures, Python programming, and system design was essential in building scalable and efficient modules. This experience bridged the gap between theory and practice, providing hands-on exposure to industry-standard tools and frameworks.

Conclusion

The completion of the internship at Cuztomise Softech Pvt. Ltd. has been a valuable and enriching experience. The final weeks of the internship focused on refining and deploying the Speech Recognition-based Support Call Analysis System. This involved building a robust pipeline from audio preprocessing to transcription using the Whisper model, storing results in SQL Server, and presenting client-wise insights via a responsive Flask dashboard. Throughout the internship, I enhanced both my technical and problem-solving skills while working on real-world business challenges. The project not only improved my understanding of speech recognition and full-stack development but also exposed me to collaborative development, debugging, and deployment practices. This hands-on experience will greatly benefit my future academic and professional pursuits in the field of software development and artificial intelligence.