

BotSum : A system for text and speech summarization



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Abstract

This cooperative education project presents BotSum, an AI-powered text and audio summarization system designed to help users efficiently extract key information from large volumes of content. The system was developed using Go (Fiber), Supabase, and Stripe for subscription management, following OWASP security guidelines and containerized with Docker supported by GitLab CI/CD. Performance and scalability were evaluated using Locust. The results demonstrate that BotSum can generate concise and accurate summaries suitable for real-world applications while providing practical experience in backend development and DevOps practices.

Introduction

The project focused on developing BotSum, a web-based AI system designed to address information overload by automatically processing and summarizing text and audio content. The backend was developed using Go (Fiber) and integrated with Supabase for authentication, database, and storage management. Core features include RESTful APIs, coin and subscription management, Stripe payment integration with secure webhook handling, and AI pipelines for speech-to-text (STT), text summarization, and text-to-speech (TTS). Additional work included system migration, security configuration (RLS and access control), API documentation with Swagger, load testing using Locust, and CI/CD deployment preparation.

Methodology

System Analysis

- Analyze functional and non-functional requirements
- Define user roles (User / Admin)
- Analyze quota, subscription, and coin management
- Define payment and security requirements

Testing & Evaluation

- Conduct functional and integration testing
- Perform load testing using Locust
- Validate security and access control
- Prepare the system for staging deployment

System Design

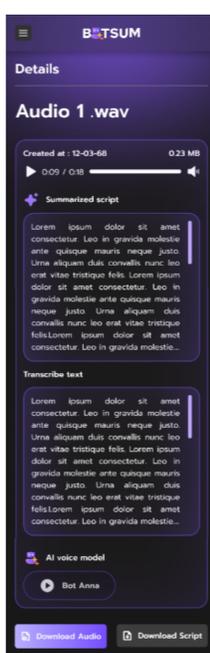
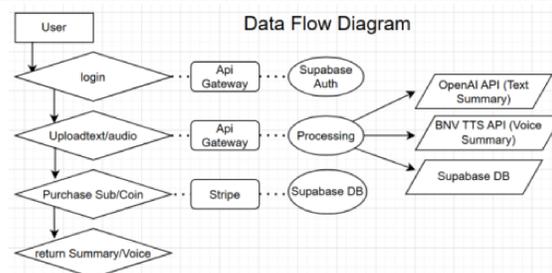
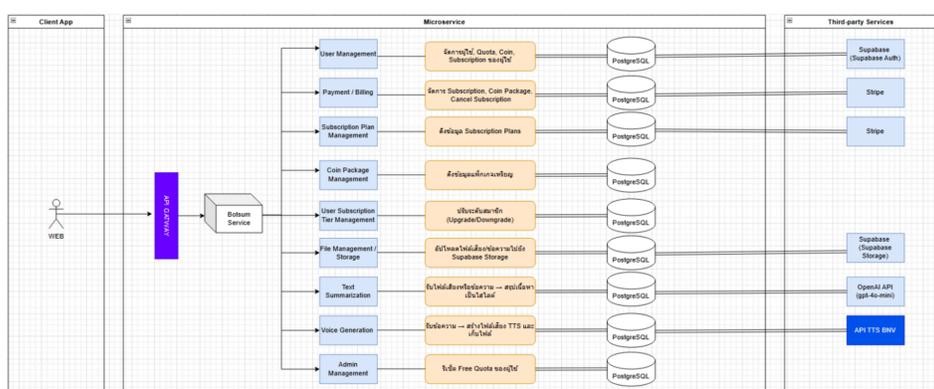
- Design the system using Object-Oriented principles
- Structure the architecture into Client, Microservices, and Third-Party Services
- Create Use Case, Class, Sequence, and Data Flow Diagrams
- Design the database schema and entity relationships
- Implement security design using JWT and OWASP guidelines

Implementation

- Develop backend using Go (Fiber)
- Integrate Supabase (Authentication, Database, Storage)
- Integrate OpenAI (Summarization) and BNV TTS
- Implement Stripe Checkout and Webhook handling
- Use Docker and GitLab CI/CD for deployment

Result & Product

- Successfully developed BotSum, a scalable AI-powered web application using Go (Fiber), Supabase (PostgreSQL), and Stripe.
- Integrated AI services for text summarization, Speech-to-Text (STT), and Text-to-Speech (TTS) processing.
- Implemented core features including:
 - User authentication and authorization
 - Content upload (text/audio)
 - Automated summarization pipeline
 - Coin-based quota and subscription management
 - Secure online payment processing with Stripe
- Conducted functional, integration, security, and load testing to validate system reliability and scalability.
- Identified minor latency issues in third-party TTS services under high load and improved performance using retry mechanisms and asynchronous processing.
- System is stable in the development environment and ready for staging deployment.



Technology



Conclusion

The BotSum project successfully developed an AI-powered web application for summarizing text and audio content with optional Text-to-Speech (TTS) generation. The system integrates membership management, coin-based quota control, and secure Stripe payment processing within a scalable Go (Fiber) microservices architecture connected to Supabase and external AI services. Testing confirmed system reliability and performance, and although further optimization and scalability improvements are needed, the project achieved its primary objectives and provides a strong foundation for future production deployment.