THE NATIONAL INSTITUTE OF ENGINEERING, MYSURU
(An Autonomous Institute under Visvesvaraya Technological University, Belagavi)

IVIS LABS

Bachelor of Engineering
in
Computer Science and Engineering

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CERTIFICATE

This is to certify that the project work entitled "**A local newspaper needs help generating concise news summarise from longer articles for their daily newsletter**" is a bonafide work carried out by **Rahul Kumar Singh (4NI22CS166), Raj Shekhar (4NI22CS167), Raj Singh Rathour(4NI22CS168), Rakesh M N(4NI22CS169), Rakshith Gowda H(4NI22CS170),** in partial fulfillment for the award of degree of **Bachelor of Engineering in Computer Science and Engineering**,Visvesvaraya Technological University, Belagavi, during the academic year **2024-25**. It is certified that all corrections / suggestions indicated during internal assessment have been incorporated and the corrected copy has been deposited in the department library. This project report has been approved in partial fulfillment for the award of the said degree as per academic regulations of The National Institute of Engineering (Autonomous Institution).

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ABSTRACT

In today's digital age, journalists and editors face the challenge of summarizing vast amounts of news content efficiently. This project presents an AI-powered chatbot designed to assist a local newspaper in generating concise summaries from lengthy news articles. Built using Django and integrated with the Ivis Labs API, the chatbot streamlines content creation by automating summarization. It features user authentication, persistent chat history, and an intuitive chat interface for a seamless user experience. With a secure and scalable architecture, the chatbot enhances productivity, allowing media professionals to focus on quality journalism. Future enhancements include multilingual support, AI customization, and mobile compatibility, making it a versatile tool for newsrooms.

ACKNOWLEDGMENT

I would like to express my sincere gratitude to my mentors, professors, and peers who provided invaluable guidance and support throughout this project. Special thanks to the developers and contributors of Django, Django REST Framework, and the Ivis Labs API, whose resources made this implementation possible. I am also grateful to my family and friends for their encouragement and motivation. Lastly, I extend my appreciation to the local newspaper team for their insights, which helped shape the chatbot's functionality to meet real-world needs.

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Chapter 1

INTRODUCTION

In the modern era of information overload, summarizing news articles efficiently is a crucial challenge for media organizations. This project aims to build an AI-powered chatbot that assists a local newspaper in generating concise news summaries from lengthy articles. The chatbot is designed to help journalists and editors streamline their content creation process for daily newsletters.

The chatbot is implemented using Django and integrates the Ivis Labs API for text summarization. It provides user authentication, chat history storage, and an intuitive user interface to ensure an optimal user experience.

Chapter 2

Project Objectives

The key objectives of this project are:

1. Automate News Summarization: Use AI to generate concise summaries from lengthy news articles.

2. User Authentication: Enable secure login and signup functionality.

3. Persistent Chat History: Store user interactions and summaries for future reference.

4. Interactive UI: Develop an aesthetically pleasing and user-friendly frontend.

5. Scalability & Security: Ensure a robust and secure system capable of handling multiple users.

Chapter 3

Technology Stack

Backend:

- Django: A Python-based web framework for rapid and scalable development.

- Django REST Framework (DRF): For API development and user authentication.

- PostgreSQL/SQLite: Database to store chat history and user details.

- *Ivis Labs API*: AI-powered summarization API to generate news summaries.

Frontend:

- HTML, CSS, JavaScript: For designing a responsive and user-friendly interface.

- Bootstrap: To enhance UI elements and ensure a clean design.

- AJAX & jQuery: To facilitate seamless user interactions.

Chapter 4

System Architecture

4.1 High-Level Overview

The chatbot follows a modular architecture consisting of:

- User Authentication Module*: Handles login, registration, and user sessions.
- Chatbot Interface: Allows users to input news articles and receive AI-generated summaries.
- Database Management: Stores user information and chat history.
- API Integration Module: Connects with the Ivis Labs API for summarization.

4.2 Workflow

1. The user logs in or registers an account.
2. The user inputs a news article into the chatbot interface.
3. The system sends the article to the Ivis Labs API.
4. The API returns a concise summary.
5. The summary is displayed in the chat interface and saved in the database.
6. Users can access their past summaries anytime.

Chapter 5

Features and Implementation

5.1 User Authentication

Users can sign up, log in, and manage their sessions securely using Django's authentication system.

5.2 Chat History Storage

Each user's chat history, including input articles and generated summaries, is stored in a PostgreSQL/SQLite database, ensuring accessibility and persistence.

5.3 AI-Powered Summarization

The chatbot utilizes the Ivis Labs API to summarize long-form news articles into concise summaries while maintaining key information.

5.4 User-Friendly UI

The front end is designed with Bootstrap for responsiveness and a modern look, featuring a clean chat interface where users can interact with the chatbot.

Chapter 6

Database Schema

Users Table

Field	Type	Description
id	Integer (PK)	Unique identifier for users
username	String	User's username
email	String	User's email
password	String	Encrypted user password

Conversations Table

Field	Type	Description
id	Integer (PK)	Unique conversation ID
user_id	Foreign Key	Links to Users table
input_text	Text	User's input article
summary	Text	AI-generated summary
timestamp	DateTime	Time of conversation

Chapter 7

Security Measures

1. User Authentication & Session Management
   - Secure login/signup with password hashing using Django's built-in authentication.
   - User sessions managed with Django's session middleware.

2. Database Security
   - Data encryption for sensitive fields.
   - Proper database indexing and optimization for performance.

3. API Security
   - The Ivis Labs API key is securely stored in environment variables.
   - Rate limiting and access control to prevent unauthorized access.

4. Input Validation & Sanitization
   - Strict input validation to prevent SQL injection and XSS attacks.
   - Usage of Django's built-in form validation.

Chapter 8

Challenges & Solutions

8.1 Handling Large Articles

Challenge: Processing large news articles within API limits.

Solution: Implemented text chunking to divide long articles and summarize them in parts.

8.2 Ensuring Summary Quality

Challenge: Summarization quality varies based on input.

Solution: Tuned API parameters and tested multiple models from Ivis Labs for optimal results.

8.3 User Experience Optimization

Challenge: Ensuring a seamless and interactive user experience.

Solution: Implemented AJAX-based real-time responses for better UI interaction.

Chapter 9

Future Enhancements

1. Multilingual Support: Extend the chatbot to support multiple languages.
2. Advanced AI Customization: Allow users to select summarization length and tone.
3. Integration with Newsletter Services: Enable direct publishing to newsletter platforms.
4. Voice-to-Text Support: Allow users to dictate news articles instead of typing.
5. Mobile App Version: Develop a mobile-friendly version of the chatbot.

Chapter 10

Conclusion

This project successfully demonstrates the integration of AI for automated news summarization in a user-friendly chatbot system. By utilizing Django for the backend, PostgreSQL/SQLite for database storage, and Ivis Labs API for summarization, the system provides a scalable and efficient solution for journalists and editors.

The authentication and chat storage features ensure that users can securely log in and revisit their previous summaries. With a clean and interactive UI, the chatbot enhances the user experience, making news summarization faster and more efficient.

Future improvements will focus on multilingual support, enhanced AI capabilities, and mobile-friendly designs to further extend the usability of this system.

Chapter 11

References

- Django Documentation: https://docs.djangoproject.com/
- Django REST Framework: https://www.django-rest-framework.org/
- Bootstrap Framework: https://getbootstrap.com/
- Ivis Labs API Documentation: [Refer to official API documentation]