Technology Hackathon

Project Title: Gen AI-Based Email Classification and OCR
Team Name: Gen AI Techies
Team members:

- Soumik Sen
- Aditi Nath
- Pratim Kanrar
- Biswajit Bhunia

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Introduction

Gen AI-Based Email Classification and OCR is the challenge we selected to solve. The task of reading numerous emails from customers, analysing the issue and raising requests to different departments accordingly is currently done manually among most organisations.This is a very demanding task and requires accuracy to deliver good customer service. With the growth of Generative AI, we have attempted to leverage its power in reducing the effort to complete this task on a daily basis. Our solution revolves around classifying the email based on its content and providing the correct category and details of the request to be raised.

Tech Stack

Front-end: React
Backend: Flask
AI: Gemini-1.5-Pro (Free)

Approach:

Dataset:

We generated about 20-30 emails for all the categories of the request types to fine-tune the Gemini-1.5-Pro gen ai model to generate accurate results for our use case.

User Interface:

We have used React to develop a web UI for the user to upload the email file. Once the user uploads the file, it is sent to our backend. The UI gets a json file as response from the backend. The response json contains the request type our module evaluated. This “request type” is shown in the UI to the user.

Backend:

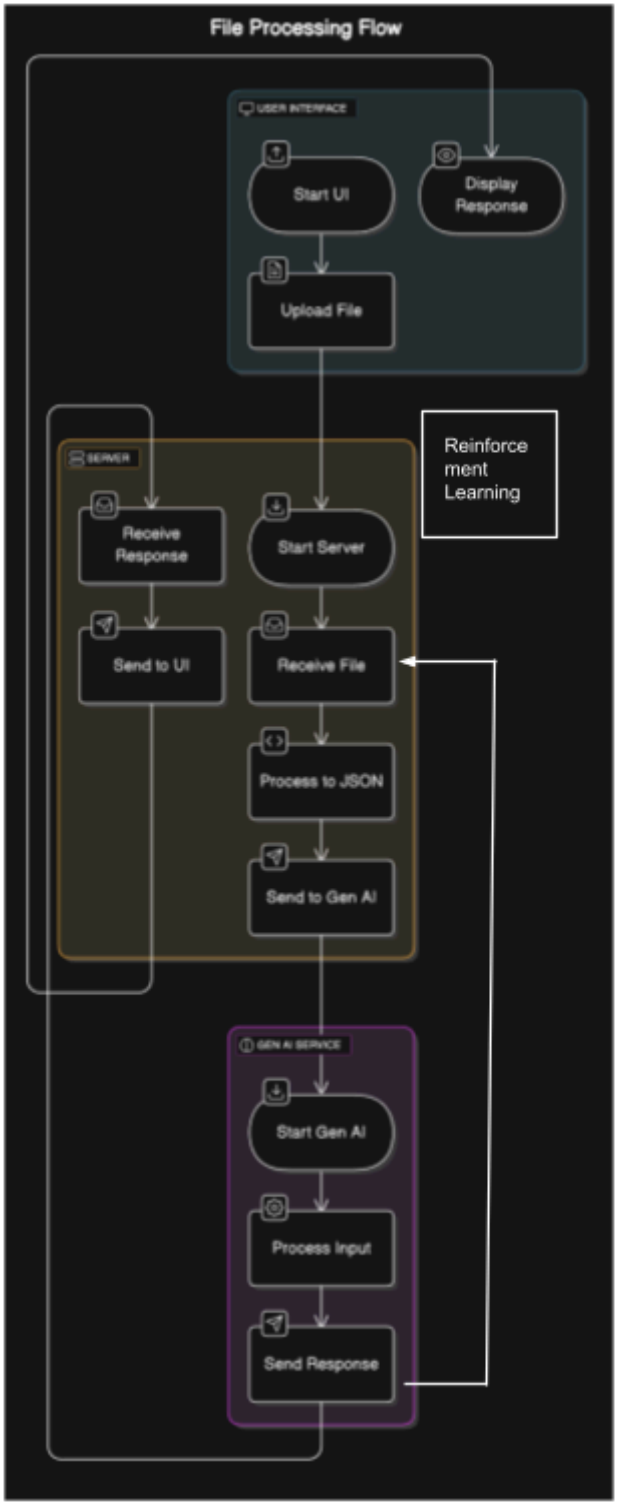
We have developed the backend using Flask. The receives the email file and processes it to text. This text is sent to our fine-tuned GenAI model, which returns the request type from the given email. The response is sent in the json format {"response": <response_text>}. In case of error, it will return {"error": <error_details>}.

GenAI model:

We have used the Gemini-1.5-Pro model. We have fine-tuned it using the dataset we generated for our scenario. It uses a system prompt we have given to figure out the instructions and categories it will have to classify the given email text in. Also we used

reinforcement learning to enhance the results. Then it will send back the generated “request type” as response to our backend.

Flow diagram:

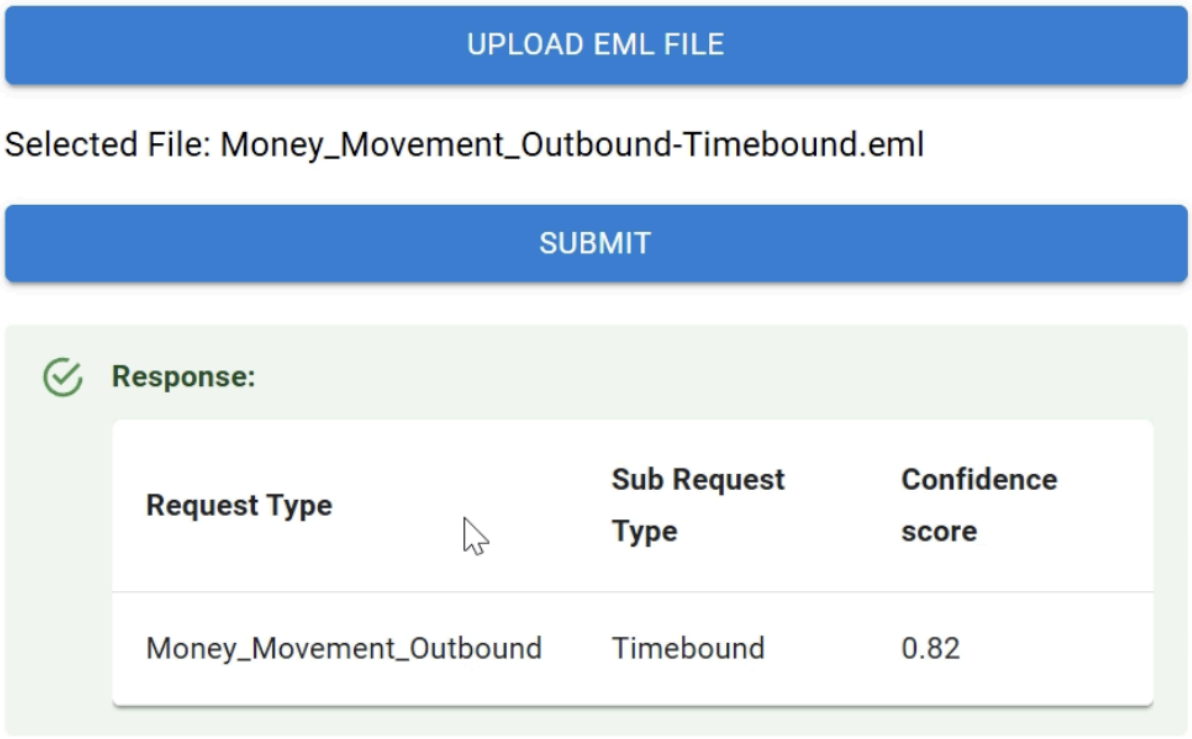


Challenges

Challenges we encountered:

1. Free GenAi API key: We were supposed to use free gen-ai api keys only. It was difficult to find as many api keys have started costing per token size and free trials have ended.
2. Dataset Generation: As no dataset was given, we generated emails related to what the loan servicing customer support may receive and categorize them accordingly.
3. Fine-Tuning: We tried using the available GenAI model, but it did not perform well for our use case. Even one-shot or few-shot prompts did not help that much. We had to adopt fine-tuning for accuracy.

Results:



Future Improvements:

1. We can implement IMAP/POP3 protocols or message queues to stream emails as they are received to automate the classification process
2. We can extend to agents to automate the raising request process after the request type and other details are received.

Conclusion:

This report detailed the development and implementation of an application designed to streamline customer service operations by leveraging generative AI for email intent classification. The system successfully automates the process of identifying and categorizing customer requests, significantly reducing manual effort and response times.The automated request generation process promises substantial improvements in efficiency and customer satisfaction. The reduction in manual processing allows customer service agents to focus on complex issues and provide more personalized support. Furthermore, the system's ability to quickly and accurately identify urgent requests ensures timely resolution, enhancing the overall customer experience. Ultimately, this application represents a significant step towards automating and optimizing customer service workflows. By harnessing the power of generative AI, we can achieve faster response times, improve customer satisfaction, and empower customer service agents to provide more effective support. This technology holds significant potential for further development and integration into broader customer service strategies.