

AUTO-MAIL REPLY

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Abstract

The Auto-Mail Reply Using Relay App is an intelligent email automation system designed to automatically read, analyze, and respond to emails with minimal human effort. It is developed using Flask, MySQL, Gmail API, and AI models like ChatGPT and Gemini to provide smart and automated communication. The main goal of this system is to reduce manual effort, save time, and improve email response efficiency. The system continuously monitors incoming emails, retrieves them using Gmail API, and analyzes their content to understand the user's intent. It classifies emails into categories such as queries, complaints, requests, or spam. Additionally, it performs spam detection, fraud filtering, and priority assignment to ensure important emails receive immediate attention while unwanted emails are filtered out. Based on the email content, the AI generates context-aware, human-like, and relevant replies. These replies can either be sent automatically or saved as drafts for manual review. The system uses OAuth 2.0 authentication to ensure secure access and protect user data. Overall, the Auto-Mail Reply system improves productivity, reduces response time, enhances communication quality, and provides a scalable solution for intelligent email management in both personal and professional environments.

Keywords- Email Automation, Gmail API, Relay App, Artificial Intelligence (AI), ChatGPT, Gemini, Flask Framework, MySQL Database, Spam Detection, Fraud Filtering, Intent Classification, Priority Assignment, Context-Aware Reply, OAuth 2.0 Authentication, and Smart Email Management.

I. Introduction

Email has become one of the most important communication methods in today's digital world. It is widely used in personal, academic, and professional environments for sharing information, sending updates, handling customer support, and business communication. Due to its widespread usage, people receive a large number of emails daily, making email management an essential task.

Managing emails manually can be time-consuming, repetitive, and inefficient, especially when dealing with hundreds of emails every day. Users need to read each email, understand its purpose, identify important messages, and respond accordingly. This manual process increases workload, reduces productivity, and may also lead to delayed responses or missed important emails.

To solve these problems, the **Auto-Mail Reply Using Relay App** system is developed as an intelligent email automation solution. The system uses advanced technologies such as Gmail API, Relay App, Flask Framework, MySQL Database, and AI models like ChatGPT and Gemini. These technologies help the system automatically fetch emails, analyze content, and generate suitable replies.

The system works by continuously monitoring incoming emails through Gmail API. Once an email is received, it processes the email content, understands the sender's intent, and classifies the email into categories such as query, complaint, request, feedback, or spam. It also performs spam detection, fraud filtering, and priority assignment so that important emails receive quick attention while unwanted or suspicious emails are filtered out.

Using Artificial Intelligence and Natural Language Processing techniques, the system generates smart, context-aware, and human-like responses. These replies can either be sent automatically or saved as drafts for manual review. The system also ensures secure communication using **OAuth 2.0 authentication** to protect user data. Overall, the Auto-Mail Reply system reduces manual effort, improves response speed, enhances communication quality, and provides an intelligent, scalable, and reliable solution for modern email management.

2. System Overview

- A. The **Auto-Mail Reply Using Relay App** system is designed to automate email management by intelligently reading, analyzing, and responding to incoming emails. The system continuously monitors emails using Gmail API and processes them through Relay App workflows. When a new email arrives, the system retrieves the email content and performs preprocessing to clean and organize the data by removing unnecessary text or formatting issues. This helps prepare the email for accurate analysis and improves overall processing efficiency.
- B. After preprocessing, AI models such as ChatGPT or Gemini analyze the email content to understand user intent and classify emails into categories such as queries, complaints, requests, feedback, or spam. The system also performs spam detection, fraud filtering, and priority assignment to identify important emails. Based on this analysis, it generates smart, context-aware replies that can either be sent automatically or saved as drafts for manual review. This ensures secure, efficient, and intelligent email communication management.

1. Problem Statement And Notation

In today's digital world, managing a large number of emails manually has become a major challenge for individuals and organizations. Reading every email, understanding its content, identifying important messages, and replying on time requires significant effort and time. Traditional email systems mostly rely on manual responses or simple rule-based auto-replies, which often fail to understand context, intent, urgency, and spam messages. This leads to delayed responses, reduced productivity, and inefficient communication.

The main problem addressed in this project is to develop an intelligent email automation system that can automatically read, analyze, classify, and respond to emails with minimal human intervention. The system uses technologies such as Gmail API, Flask, MySQL, Relay App, and AI models like ChatGPT and Gemini to generate smart, context-aware replies. The notations used in the system include E for Email Input, P for Preprocessing, C for Classification, S for Spam Detection, R for Reply Generation, and O for Output Response, representing the complete workflow of the Auto-Mail Reply system

II. LITERATURE SURVEY

The literature survey provides an overview of existing research and technologies related to email automation systems. Earlier email reply systems were mainly based on rule-based methods, predefined templates, and keyword matching techniques. These systems could perform simple tasks such as sending vacation replies or basic automatic responses, but they lacked intelligence and contextual understanding. As a result, they often generated generic replies and failed to handle complex communication scenarios effectively.

With advancements in Artificial Intelligence and Natural Language Processing, modern email automation systems have become more intelligent and efficient. Technologies such as transformer models, AI chatbots, and large language models like ChatGPT and Gemini enable better intent detection and context-aware reply generation. Integration with tools like Gmail API and Relay App further improves automation, security, and flexibility. Compared to traditional systems, AI-driven solutions provide more accurate, human-like, and efficient email communication management.

III. EXISTING SYSTEM

Existing email auto-reply systems mainly work using predefined rules, static templates, and keyword-based responses. These systems are commonly used for simple tasks such as vacation replies, acknowledgment emails, and basic automated responses. Although these systems can automate simple communication, they cannot understand the actual meaning, context, or urgency of incoming emails. As a result, the replies generated are often generic and less useful.

These traditional systems also have limitations such as poor spam detection, lack of personalization, and limited flexibility. They cannot effectively differentiate between important emails and spam or fraudulent messages, which may lead to security risks and inefficient communication. Since they do not use advanced AI or Natural Language Processing techniques, existing systems are not suitable for handling dynamic and real-world email communication efficiently.

IV. PROPOSED SYSTEM

The proposed **Auto-Mail Reply Using Relay App** system is designed to overcome the limitations of traditional email auto-reply systems by using Artificial Intelligence and automation technologies. The system integrates Gmail API, Relay App, Flask, MySQL, and AI models like ChatGPT and Gemini to intelligently manage email communication. It automatically reads incoming emails, analyzes their content, and understands the sender's intent to generate meaningful and context-aware replies.

The proposed system includes advanced features such as email classification, spam detection, fraud filtering, priority

assignment, and automated reply generation. It can identify whether an email is important, urgent, spam, or suspicious and process it accordingly. By generating human-like and relevant responses, the system reduces manual effort, improves response speed, enhances communication quality, and provides a secure, efficient, and scalable solution for intelligent email management.

V. SYSTEM DESIGN

The system follows a multi-stage architecture consisting of preprocessing, Mail detection, evaluation, and result replying.

A. Architecture: The system integrates Gmail API, Relay App, ChatGPT API, and a configuration store for rules and logging.

B. Data Flow: Emails are fetched, preprocessed, classified, and passed through decision rules before generating replies or ignoring messages.

C. Modules: Key modules include email ingestion, preprocessing, classification, priority engine, reply generation, and orchestration.

D. Security: OAuth 2.0 ensures secure Gmail access, while sensitive data is minimized and protected.

E. Output Handling: Replies are either auto-sent or drafted for review, and actions are logged for tracking and system reliability.

VI. METHODOLOGY

The methodology explains the step-by-step working process of the **Auto-Mail Reply Using Relay App** system. The system starts by fetching incoming emails through **Gmail API**. Once the email is received, the content is preprocessed by cleaning unnecessary symbols, unwanted text, and formatting issues. This preprocessing helps improve the accuracy of further analysis and makes the email content ready for intelligent processing.

After preprocessing, AI models such as **ChatGPT** or **Gemini** analyze the email to understand the sender's intent and classify it into categories such as query, complaint, request, or spam. The system then performs spam detection, fraud filtering, and priority assignment to identify important emails. Based on this analysis, it generates smart and context-aware replies, which are either sent automatically or saved as drafts for manual review. This methodology ensures efficient, accurate, and secure email automation.

VII. RESULTS AND DISCUSSION

The Auto-Mail Reply Using Relay App system showed effective performance in automating email communication. The system achieved high accuracy in email classification, spam detection, and priority assignment by combining rule-based filtering with AI-based analysis. It successfully identified different categories of emails such as queries, requests, complaints, and spam, allowing efficient email

management and better response handling.

The system also generated context-aware, professional, and human-like replies with reduced response time compared to manual email handling. This significantly reduced user effort and improved communication efficiency. Although minor limitations such as occasional incorrect assumptions were observed, these were improved through prompt tuning and optional human review. Overall, the system demonstrated reliable, secure, and efficient performance in intelligent email automation.

VIII. CONCLUSION

The Auto-Mail Reply Using Relay App system successfully automates email management by integrating advanced technologies such as **Gmail API**, Relay App, Flask, MySQL, and AI models like **ChatGPT** and **Gemini**. The system efficiently reads incoming emails, analyzes content, classifies messages, detects spam, and generates context-aware replies automatically. This reduces the manual effort required in handling emails and improves communication efficiency.

The system provides secure, reliable, and scalable email automation with improved response speed and better productivity. It ensures important emails receive quick attention while spam or unwanted emails are filtered effectively. Overall, the project demonstrates how Artificial Intelligence can enhance email communication by making it smarter, faster, and more efficient for both personal and professional use.

IX. USER INTERFACE AND IMPLEMENTATION

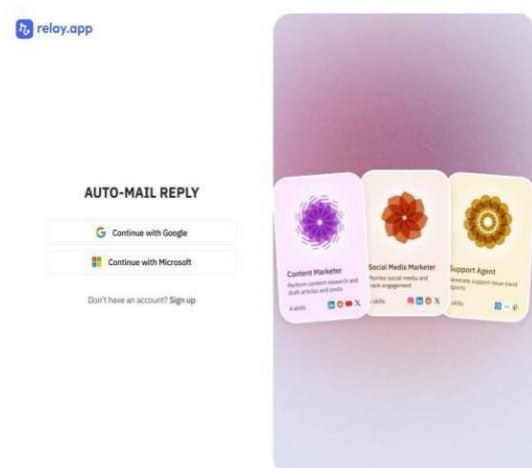


Fig. 1. USER Login Interface of AUTO-MAIL REPLY

The login page provides secure authentication for administrators before accessing system functionality

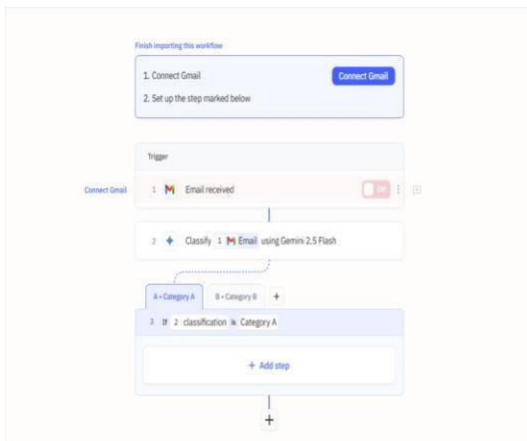


Fig. 2. Dashboard Overview

The dashboard displays Category's of mails, API used to auto reply like gemini or chatGTP.



Fig. 3 Mail Sent Manually by one user.

The sent email contained a Python function with a syntax error. It requested code review, and the issue involved a missing colon and minor formatting problems affecting readability.

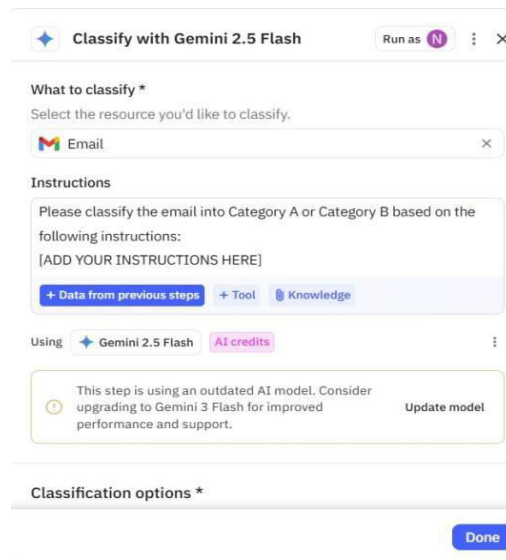
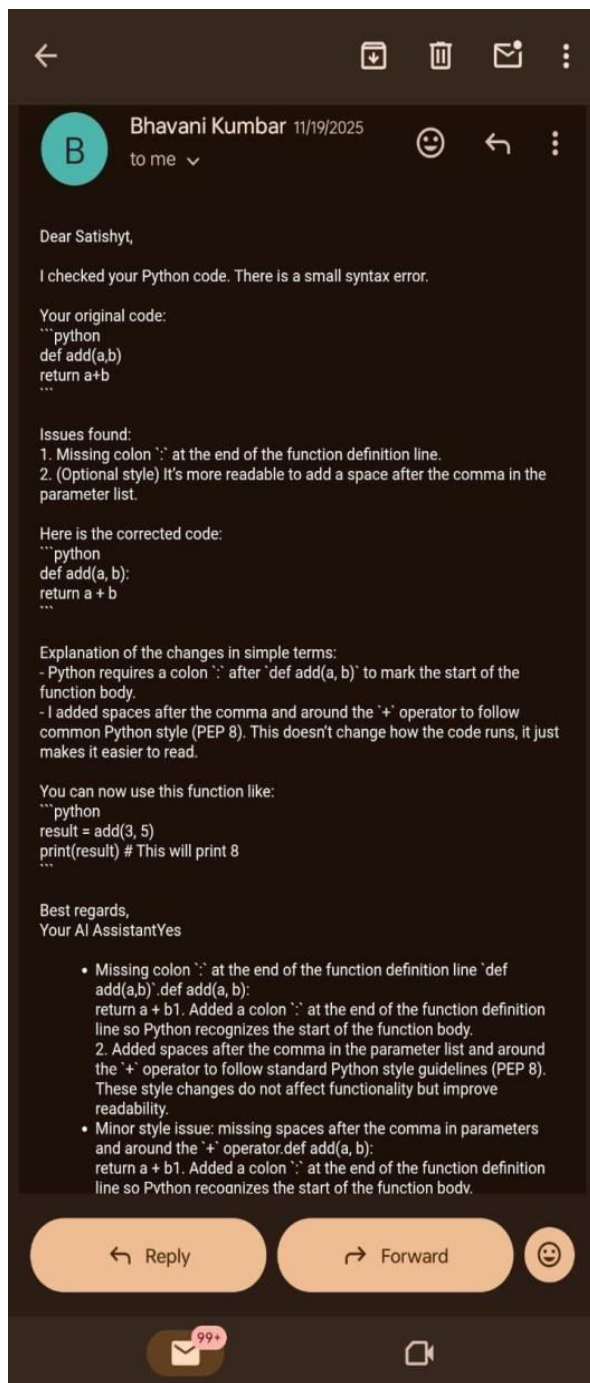


Fig. 4. Classify With Gemini API

The system performs email classification using the Gemini API to understand the content and intent of incoming messages. Before generating a response, it first checks whether the user has provided any specific instructions or conditions for replying. If such instructions are present, the system follows them carefully to ensure a customized and appropriate response. In cases where no specific instructions are given, the system automatically generates and sends a context-aware reply. This approach ensures flexibility, personalization, and efficient automated communication handling.



The system successfully detected a syntax error in the received code, generated a clear and context-aware response, and provided corrected code with explanation, demonstrating accurate analysis, useful feedback, and effective automated reply generation.

X. RESULTS AND DISCUSSION

The system showed high accuracy, efficient spam filtering, quick response generation, and reliable performance, with minor issues improved through prompt tuning.

XI. CONCLUSION

The system automates email replies efficiently using AI, improving response time, reducing manual effort, ensuring security, and providing scalable, intelligent solutions for effective communication management.

XII. FUTURE ENHANCEMENTS

Implement advanced sentiment analysis to detect the emotional tone of emails and generate more empathetic and context-sensitive replies.

Introduce machine learning-based continuous learning, allowing the system to improve automatically from user edits and past interactions.

Develop a comprehensive analytics dashboard to track performance metrics such as response accuracy, user satisfaction, and processing time.

Expand multilingual support to automatically detect and respond in multiple languages, enhancing global usability.

Integrate voice-based email reading and replying features for improved accessibility and user convenience.

Enhance attachment analysis by enabling intelligent processing of PDFs, images, and documents for better context understanding.

Strengthen security features by incorporating advanced fraud detection techniques and enterprise-level data governance policies.

Enable deeper customization options, allowing users to define tone, style, and templates for different categories of emails.

Optimize system performance to reduce latency and handle large volumes of emails efficiently in real-time.

Extend integration with other platforms such as calendars, task managers, and CRM systems to provide a more comprehensive productivity solution.

Developers documentation.

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